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THE  
FALES & JENKS  
RING TWISTER  
FOR COTTON

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1909

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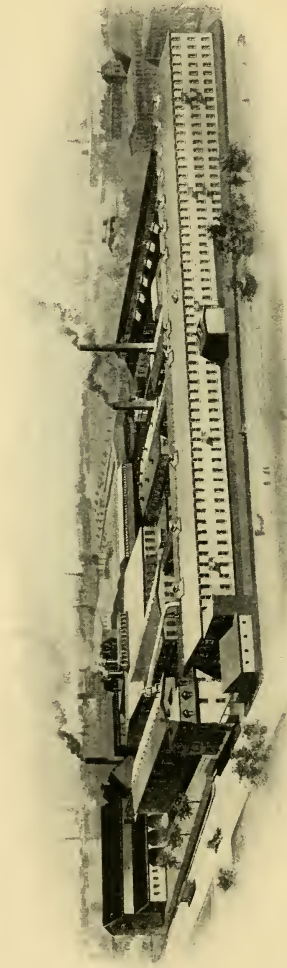




J. A. W. Lane.

Hargraves & Parker

Feb 1, 1911



WORKS OF THE FALES & JENKS MACHINE CO.  
1909

ILLUSTRATED CATALOG  
AND  
HANDBOOK OF FORMULAS AND TABLES  
RELATING TO  
THE FALES & JENKS  
RING TWISTER  
FOR COTTON.

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FALES & JENKS MACHINE COMPANY,

BUILDERS OF  
RING SPINNING MACHINERY  
FOR COTTON.

RING TWISTING MACHINERY  
FOR COTTON, WOOL AND WORSTED.

PAWTUCKET, RHODE ISLAND, U.S.A.

ESTABLISHED 1830.

INCORPORATED 1876.

ALBERT A. JENKS, PRESIDENT.

LE ROY FALES, SECRETARY.

STEPHEN A. JENKS, TREASURER.

SOUTHERN OFFICE, CHARLOTTE, N.C.

J. H. MAYES, AGENT.

WRITTEN AND COMPILED BY

HERBERT G. BEEDE.

1909

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FALES & JENKS MACHINE COMPANY

E. L. FREEMAN COMPANY  
PRINTERS  
PAWTUCKET, R. I.

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## INTRODUCTION

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In compiling this catalog we have endeavored to give such information as will be useful and convenient for those interested in our ring twisters.

We build both the Scotch and American system ring twisters, the latter in two types — one the well known type and the other a new and improved box-head, adjustable type.

The floor plans, lengths and general arrangement of driving pulleys, shown and described in this book, apply to either style of twister.

The twist gearing tables as given are based upon the arrangement of the twist gearing used on the old type American twister; but these tables are intended also for use with the Scotch twister and the new type box-head American twister, as will be explained in connection with the twist gearing formulas, given for each style of twister. Our new American twister has been designed so that, by the use of a convenient system of compound gearing, the extreme ranges of twist, now required in the twisting of yarns for various purposes, may be easily and quickly obtained.

In our ply twist tables up to and including six ply, we have covered the full range and general variations of twist now used for various classes of work in the yarn and weaving mills of the United States.

Our production tables of ply yarns, from two to six ply inclusive, are based on the average

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results actually obtained in practice, and furthermore we have endeavored, not only to give the production of the different numbers of yarn, but also to show, in connection with the table of bobbin dimensions, the general conditions upon which that production is based.

Recognizing the importance of proper bobbins for the various sizes of rings and varieties of twisting, we have prepared a set of bobbin drawings showing the several styles of bobbins used, together with a table of dimensions for both wet and dry twist, including also weight of yarn on the various sizes and styles of bobbins.

For convenience in finding the relative speeds of cylinder and spindle, for different sizes of cylinder and spindle-whirl, we have introduced our cylinder speed tables.

The specification form, which we have given in this book, shows the information required to enable us to properly execute an order for ring twisters.

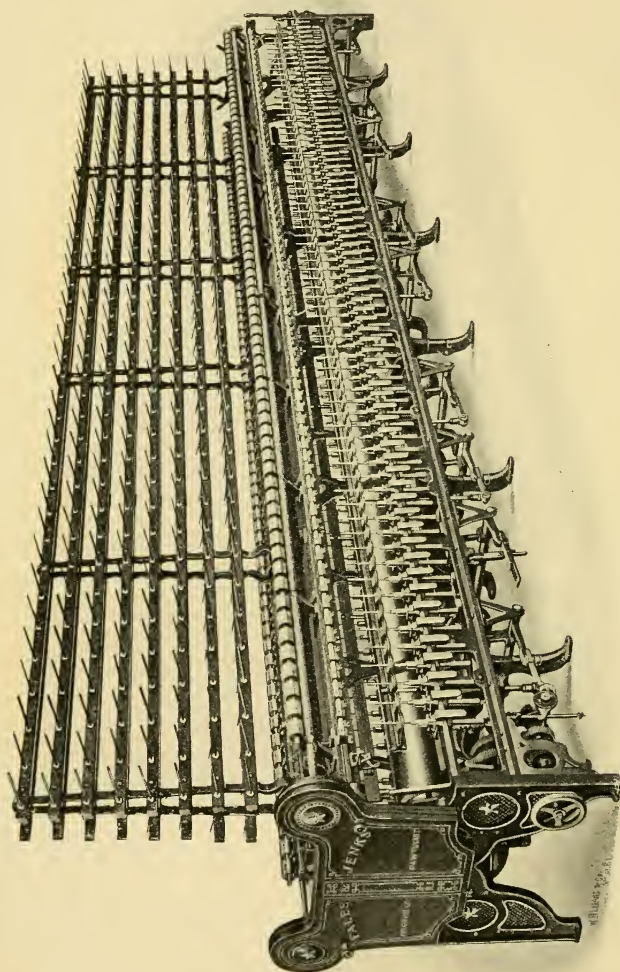
We are always ready to give any information desired concerning our ring twisting machinery, or in regard to our ring spinning machinery, illustrated and described in our book, "The Fales & Jenks Ring Spinning Frame for Cotton."

# INDEX

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|  | PAGE    |
|--|---------|
| CUT OF TWISTER, OLD TYPE, AMERICAN SYSTEM . .                            | 8       |
| DESCRIPTION OF TWISTER, OLD TYPE, AMERICAN<br>SYSTEM . . . . .           | 9       |
| CUT OF TWISTER, BOX-HEAD TYPE, AMERICAN SYSTEM                           | 10      |
| DESCRIPTION OF TWISTER, BOX-HEAD TYPE, AMERICAN<br>SYSTEM . . . . .      | 11-19   |
| CUT OF TWISTER, SCOTCH SYSTEM . . . . .                                  | 20      |
| DESCRIPTION OF TWISTER, SCOTCH SYSTEM . . . .                            | 21      |
| FLOOR PLANS . . . . .  | 22      |
| LENGTH TABLE . . . . .   | 23-25   |
| TWIST GEARING, OLD TYPE, AMERICAN SYSTEM . .                             | 26      |
| TWIST FORMULAS, OLD TYPE, AMERICAN SYSTEM .                              | 27      |
| TWIST GEARING, BOX-HEAD TYPE, AMERICAN SYSTEM                            | 28      |
| TWIST FORMULAS, BOX-HEAD TYPE, AMERICAN SYSTEM                           | 29      |
| BOX-HEAD GEARING . . . . .   | 30-31   |
| TWIST GEARING, SCOTCH SYSTEM . . . . .                                   | 32      |
| TWIST FORMULAS, SCOTCH SYSTEM . . . . .                                  | 33      |
| TWIST GEARING TABLES, 7" CYLINDER, FOR 36" AND<br>39" TWISTERS . . . . . | 34-47   |
| TWIST GEARING TABLES, 8" CYLINDER, FOR 36" AND<br>39" TWISTERS . . . . . | 48-61   |
| TWIST GEARING TABLES, 7" CYLINDER, FOR 42"<br>TWISTER . . . . .          | 62-73   |
| TWIST GEARING TABLES, 8" CYLINDER, FOR 42"<br>TWISTER . . . . .          | 74-85   |
| TWIST GEARING TABLES, 6" GROOVED PULLEY, FOR<br>42" TWISTER . . . . .    | 86-97   |
| TWIST TABLES, TWO PLY . . . . .  | 98-101  |
| TWIST TABLES, THREE PLY . . . . .  | 102-105 |
| TWIST TABLES, FOUR PLY . . . . .   | 106-109 |
| TWIST TABLES, FIVE PLY . . . . .   | 110-113 |
| TWIST TABLES, SIX PLY . . . . .  | 114-117 |
| PRODUCTION TABLES, EXPLANATION . . . . .                                 | 118-119 |
| PRODUCTION TABLES, TWO PLY . . . . .                                     | 120-121 |
| PRODUCTION TABLES, THREE PLY . . . . .                                   | 122-123 |
| PRODUCTION TABLES, FOUR PLY . . . . .                                    | 124-125 |
| PRODUCTION TABLES, FIVE PLY . . . . .                                    | 126-127 |
| PRODUCTION TABLES, SIX PLY . . . . .                                     | 128-129 |
| BOBBINS FOR TWISTING . . . . .   | 130-131 |
| CYLINDER SPEED TABLE, 7" CYLINDER . . . . .                              | 132-133 |
| CYLINDER SPEED TABLE, 8" CYLINDER . . . . .                              | 134-135 |
| CYLINDER SPEED TABLE, 6" GROOVED PULLEY . .                              | 136     |
| TABLE OF RATIOS FOR TWISTING . . . . .                                   | 137     |
| SPECIFICATIONS FOR TWISTERS . . . . .                                    | 138-139 |

# RING TWISTER



RING TWISTER AS BUILT FROM 1880 TO 1907  
CUT SHOWS WET TWISTER WITH REVERSIBLE BRASS PLATE RING RAIL



# RING TWISTER

OLD TYPE—AMERICAN SYSTEM

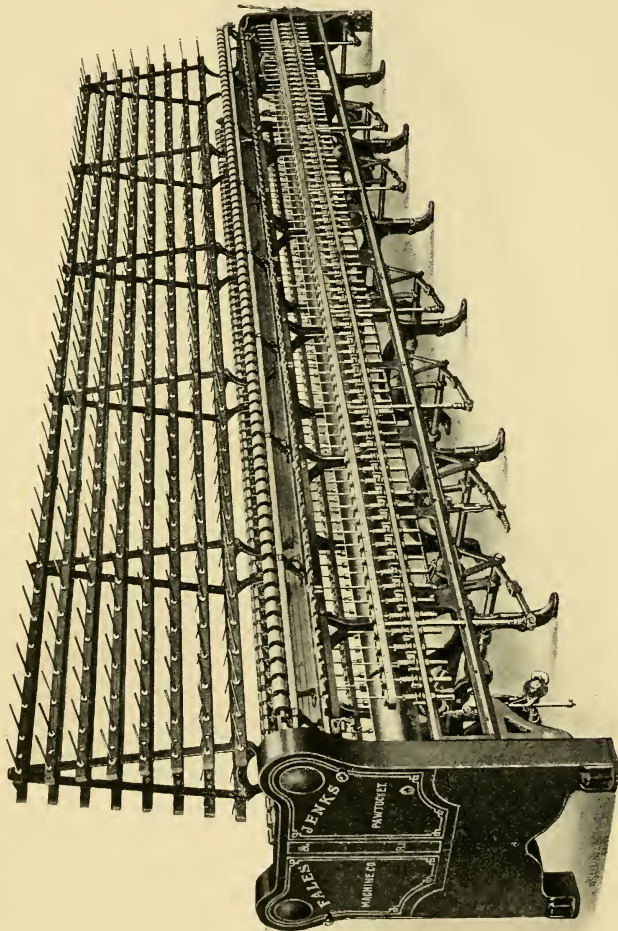
FOR WET OR DRY TWISTING

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The well-known type of twister shown on the opposite page has been our standard since 1880. This type we build in three widths — 36 inches, 39 inches and 42 inches. The 36 inch twister is made in two heights — for 5 to 6 inch and 6½ to 7 inch traverse, while the 39 and 42 inch twistors are made in one height only — for 5 to 6 inch traverse.

Numerous improvements have been applied from time to time to meet the requirements of the trade. Among the improvements of recent years may be mentioned, in order of their application, the following: — Upright shaft and change gear drive for the builder motion; adjustable jack gear stands for either single or double twist gearing; water trough with glass rod lifting device; guide rod traverse motion driven from foot end roll; lifting thread board with blocks and porcelain guides; our patent ring rail lock for doffing; adjustable feet for centres; ring rail wind-down, and many other improvements, all of which have been embodied in our new box-head type of twister.

The old type of twister has always given perfect satisfaction, and we are still building it for those desiring to match their present equipment.



RING TWISTER WITH BOX-HEAD  
CUT SHOWS DRY TWISTER WITH CAST IRON RING RAIL

# RING TWISTER

## BOX-HEAD TYPE—AMERICAN SYSTEM

### FOR WET OR DRY TWISTING

---

On the opposite page is shown a cut of our new type American twister with box-head. This twister we have designed and built with the following points in view: to make a rigid, substantial twister by means of ribbing and bracing; to make a simple twister, easily oiled and cleaned; to make a convenient twister with a wide range of twist gearing easily accessible, and finally, to make an adjustable twister easily leveled and completely adjustable for the different lengths of traverse.

This type of twister is built in three widths — 36 inches, 39 inches and 42 inches — each width of one height only, but adjustable for any length of traverse from 5 inches to 7 inches. The overall lengths, with the various combinations of pulleys and outside bearings, are the same as given for our old type of twister.

**The Box-head** retains the general form and neat appearance of our older type. An exclusive feature of this head is the heavy inside cross rib, which serves not only to strengthen the head, but also to completely separate the upper from the lower part. This latter feature is important since it obviates the liability of dropping gears, nuts and wrenches into the lower part of the head, and it also prevents the dangerous accumulation of oily waste and fly therein.

The upper part of the head is enclosed by hinged doors, provided with spring latches,

while the lower part has loose covers which can easily be removed without loosening bolts, nuts or screws. The opening in the back of the head necessary for the introduction of the cylinder shaft and jack gear stand, is made sufficiently large to allow the easy removal of the cylinder, and is provided with a cover to prevent the entrance of fly and dirt into the head.

**The Foot End and Centres** have been entirely redesigned. They have been provided with heavier ribbing to obtain strength, with smooth surfaces to prevent collection of fly and dirt and with elongated bolt holes for the up and down adjustment of the spindle rails.

**A New Patent Adjustable Foot** has been applied to every support, including the head and foot end as well as the centres. This adjustable foot is unquestionably the neatest, simplest and most substantial device for the purpose, now on the market. It consists of a cast iron shoe as a support, a large jack screw for the adjustment and bolts for clamping the shoe securely in place. The shoe encloses the jack screw, and thus prevents it from collecting fly and dirt.

**The Frame Work** is of the regular construction, with angle roller beams and heavy box rails. The box rails have web pieces for bracing between the centres, as well as for bolting to the centres. On the 42 inch width of twister, which is designed for heavy work, we use an extra heavy box rail. An exclusive and valuable feature of our new twister is the construction and arrangement by which the box rails with all the attached parts may be raised or lowered to suit the various conditions of traverse, for wet or dry and for fine or coarse work.

**The Ring Rails** are made in two styles, one the well known Jenks reversible brass plate ring rail, which is intended for wet twisting only, the other the common cast iron ring rail, which is used on both wet and dry twisters.

The brass plate ring rail consists of a series of brass plates, in which the rings are inserted, each plate supported at the back and firmly riveted between two T shaped iron bars, the whole forming one complete section of ring rail.

The cast iron ring rails are made strong and rigid by means of deep flanges, both front and back, extending the full length of the under side. All ring rails are made in short lengths with two lifting rods only for each rail.

**The Creel** can be made in almost any style and size to suit requirements.

The most common form is the rack creel with cast iron creel stands, horizontal skewer rails and wire skewers. This form of creel can be made for any number of ply from two up to the limit of practical operation. The creel stands are made strong and rigid and are firmly secured to the deck by bolts extending through cross girts which in turn are bolted to the roller beams. The skewer rails are securely bolted to lugs on the creel stands, while the skewers extend entirely through the rails and are fastened with a nut at the back.

For fine work we can furnish a vertical or spinning style of creel. This creel is usually made two stories high to take only one skewer per spindle, as it is generally considered better to double the yarn before twisting. This creel is rigidly supported by means of upright rods securely bolted to cross girts, fastened to the roller beams, while each end of the creel is braced and supported by adjustable castings bolted to

a cast iron base, which in turn is bolted to a cross girt.

**The Cylinders** may be either 7 or 8 inches in diameter, as required, and are always made in short lengths to insure strength and durability.

The noise of the cylinder has been practically eliminated by the use of a short head end section, which effectually prevents the vibration due to the gearing from producing a hum in the cylinder. The cylinder bearings are of ample dimensions and are self-oiling.

For heavy twisting we usually furnish a double grooved cast iron pulley in place of the tin cylinder. These grooved pulleys are made either 6, 7 or 8 inches in diameter and are carried on a shaft of ample size, supported by bearings closely spaced throughout the length of the twister.

**The Driving Shaft** is unusually large and is supported at its outer end by a substantial outrigger, which effectually prevents any belt strain from affecting the cylinder. The outrigger is made with a cross bar which can be easily removed when changing pulleys. In the case of the grooved pulley the driving shaft is a continuation of the pulley shaft.

**The Driving Pulleys** are made in sizes from 7 inches to 18 inches in diameter, and from 2 inch to 4 inch face. The loose pulley is provided with an oil cavity, and is either supported by a stationery self-oiling bushing or carried on a revolving pulley bushing fastened to the driving shaft, as may be preferred. The driving pulleys are always placed at the foot end of the twister.

**All Gearing** is totally enclosed. All the spur gears are cut on automatic machinery, and the



worm gears are accurately hobbled on special machines. All gear shaft bearings have been increased in length and size, and generous oil pockets are provided so that every bearing can be oiled from the back of the head, while the twister is running. The thrust of the builder motion worm is sustained by a hardened steel collar provided with special means for lubrication.

**The Twist Gearing** as now arranged differs somewhat from that of the old type of twister. The modern requirements for twisting demand a very wide range of twist, and in order to meet this we have introduced a system of compound gearing, whereby it is possible, not only to match the twist constant of any old type twister, but also to obtain almost any twist by changing either the cylinder gear, the variable cylinder gear, or the regular twist gear. All of these gears are interchangeable, so that one set of twist gears will make all the required changes without any change of the jack gear. With this system of twist gearing each side of the twister can be geared independently and a wide difference of twist obtained, since the variable cylinder gear and the regular twist gear on each side are change gears. The twist gearing is entirely within the box-head, which provides sufficient space for any required range of gearing.

**The Builder Motion** has been changed slightly from our old pattern, but retains the various styles and combinations, being arranged for straight, taper top, reverse taper top, warp, filling or a combination of any two as desired. The change from one wind to the other of any combination is easily and quickly made, since both the cams and the builder arm remain always

in place. The builder is driven by means of a train of spur and bevel gears, and an upright shaft, worm and worm gear, with the result that practically all back-lash in the cam motion is prevented. We still retain, but in a new and more convenient form, our method of changing the speed of the wave by the use of a change or lay gear. This arrangement, first introduced by us some ten years ago is already familiar to the users of our machinery. One of the features of our new twister is the ring rail wind down, which is so arranged that it can be easily and conveniently operated from the front of the head end by means of a special independent crank.

When the crank is inserted, a clutch is unlocked and the ring rails may then be raised or lowered as desired. The withdrawal of the crank allows the clutch to positively lock again and the regular traverse of the ring rail continues as before. The Jenks patent doffer lock, which holds down the ring rail for doffing, now appears in new form with heavier doffer beam, corrugated foot lever and adjustable lock.

**The Roll Stands** are of smooth and pleasing design; are strong and substantial; are all milled to a standard, and the roll bearings are provided with German silver bushings, which not only obviate the wear of the roll necks, but which are themselves easily replaced when worn.

**The Bottom Rolls** for dry twisters are made of steel, and are accurately ground to stand the test of limit gauges, which have a variation of only one and one-half thousandths of an inch either side of the specified size.

For wet twisters the bottom rolls are made of brass tubing, the female end being formed by a malleable iron plug, while the male end consists of a steel plug on which the roll neck is formed.



**The Top Rolls** for dry twisters are made of cast iron carefully turned and polished. For wet twisters the top rolls are made of cast iron and covered with brass tubing, while the ends of the rolls are painted to prevent rusting.

**The Feed Roll Combinations** for either wet or dry twisting are as follows: single line bottom and top rolls; double line bottom and single line top rolls; also double line bottom and double line top rolls. The bottom rolls are almost invariably  $1\frac{1}{2}$  inches in diameter, while the top rolls for the first two styles are usually  $2\frac{1}{8}$  inches in diameter, and for the last style are usually  $1\frac{3}{4}$  inches in diameter. The bottom rolls can be furnished either plain, fluted, or bossed and fluted, as desired, but the top rolls are usually furnished plain. The feed rolls of all styles may be run either outwardly or inwardly, as desired.

**Cap Bars** are provided to hold the top rolls in position for both the single line bottom and top roll, and the double line bottom and top roll styles, but are not required for the double line bottom and single line top roll style. The cap bars are of neat design, are strong and substantial, and all available space is given to the length of top rolls. A rack is provided on the cap bars for each top roll, so that upon their removal from the bottom rolls, they may be supported on the rack by means of their trunions.

**The Water Troughs** used for wet twisting are located directly back of the feed rolls. These troughs are made of sheet brass, strengthened back and front by being crimped onto wire rods and are locked onto a series of trough stands by means of clamps at the front of each stand. They are made in from one to three lengths to

suit the twister, and are coupled together by means of outside flanged couplings and rubber packings, so that the trough is in effect continuous from end to end. The foot end of each trough is now provided with our new screw cock outlet, provided with a leather packing washer, which can be easily renewed when necessary. The trough ends and couplings are not only soldered, but also riveted to the sheet brass, as experience has proved that the solder will deteriorate and the trough if not riveted will eventually leak. The glass trough rods are carried by fingers supported by a lifter shaft at the back of the troughs, so arranged that, by means of a lifter handle at the foot end of the twister, the glass rods may be lifted out and swung back, leaving the trough free from obstructions and thus convenient for cleaning.

**The Guide Rods** are located directly back of and close to the roll stands, so that the yarn is accurately guided to the feed rolls. The guide rods are provided with cast iron shoes, which lock into the supporting stands, but which are free to move lengthwise for the traverse. By moving the rods slightly beyond the traverse limits in either direction, the entire rod may be easily removed from the supporting stands.

For dry twisters we provide a wooden guide rod with common iron guide wires. For wet twisters, intended for fine work, we provide a wooden guide rod with a special brass guide and drip wire; but for coarse work we now use a sectional bronze rod with porcelain guides. For wet twisting the guides are so arranged that the surplus water is returned to the water trough.

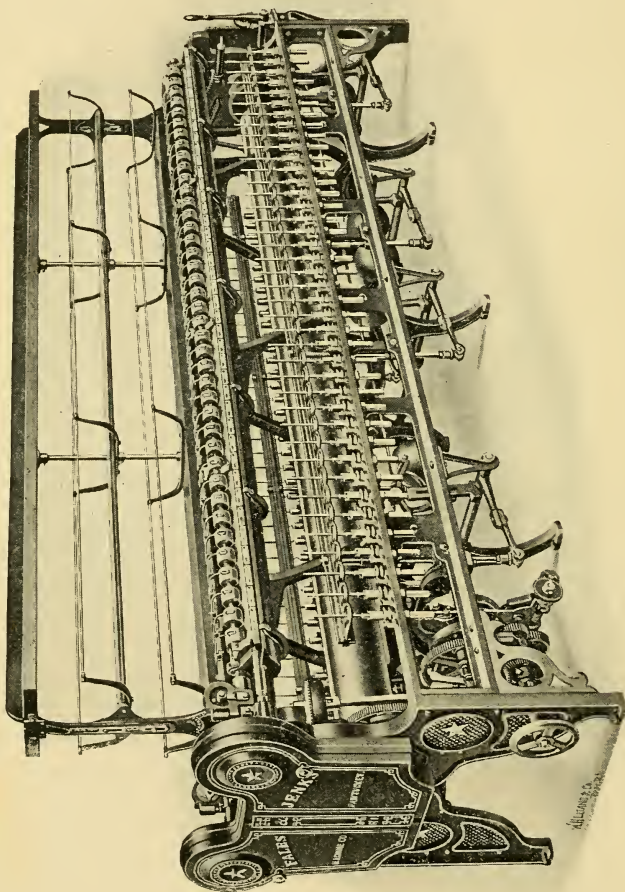
**The Guide Rod Traverse Motion** now applied to all our twisters is our patent geared motion

with adjustable traverse; it is located at the foot end of the twister, and is driven by a worm extending from the end of the roll. These motions are compact units with all gearing encased, and each side of the twister is provided with a separate motion.

**The Spindles** which we furnish with our twisters are all manufactured in our own plant, on machinery specially designed and built by us for the purpose. The fact that we have manufactured spindles for more than half a century demonstrates our extensive experience in this important part of our business. We can furnish various styles and types of spindles, and have a large list of sizes suited to all grades of work from the finest to the coarsest ring twisting.

**The Rings** furnished with our twisters are of various styles and sizes. For dry twisting, up to a 3 inch ring, we usually furnish either double flanged ring in a cast iron holder, or a common flanged ring. Above the 3 inch size the common vertical is preferred. For wet twisting, up to and including a 3 inch ring, we can furnish band rings for the Jenks reversible brass plate ring rails also band rings in brass or iron plate holders screwed to top of cast iron ring rails. Common vertical rings in cast iron ring rails can be furnished in any size from  $1\frac{1}{2}$  inches to  $4\frac{1}{2}$  inches in diameter.

**The Thread Boards** usually furnished are the Walmsley lifting. For dry twisting they are usually made with blocks and common iron guide wires. For wet twisting we furnish a solid board, or a board with blocks, either of which can be provided with the oblong brass guide, or our porcelain guide with a retaining guide wire.



RING TWISTER, SCOTCH SYSTEM  
CUT SHOWS VERTICAL OR SPINNING STYLE OF CREEL

## RING TWISTER

### SCOTCH SYSTEM WITH SINGLE CYLINDER FOR WET TWISTING ONLY

---

On the opposite page is shown a cut of our Scotch system single cylinder twister.

The Scotch system of wet twisting was introduced into this country some thirty years ago, by the Scotch makers of sewing thread, and its use has been confined almost exclusively to the manufacture of thread since that time.

In this system the bottom rolls, which are always made of brass tubing  $2\frac{1}{2}$  inches in diameter, revolve in the water trough; thus the yarn in passing under the roll is immersed in the water.

The bottom rolls, top rolls, cap bars, guide rods and thread boards are all carried by a dead roll at the back of the trough. The entire mechanism is counterweighted and, being provided with a quadrant and worm at the foot end of the twister, can be easily raised from the trough to facilitate cleaning.

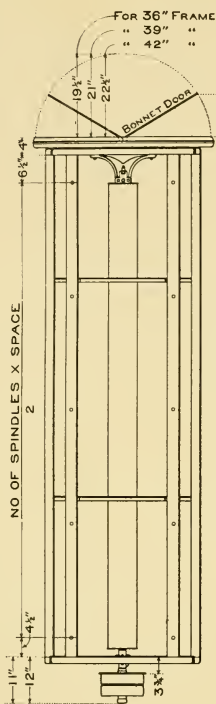
A great improvement in our later twisters of this style lies in the method of attaching the required parts to the dead roll. Formerly it was necessary, in the event of any breakage, to strip all the parts from this roll. In our later machines all parts are so attached that they can be separately removed and replaced.

As far as applicable all the improvements mentioned in connection with the old type American twister have been applied to our Scotch twisters.

The single cylinder Scotch twister is made in the 36 inch width only, but in two heights — for 5 inch and 6 inch traverse.

The cut opposite shows the vertical or spinning style of creel as applied to twisters and is particularly desirable for fine two or three ply work, as it allows the use of a fair sized creel spool without the danger of breaking back.

# FLOOR PLAN FOR TWISTERS





# LENGTH TABLE

LENGTH OF TWISTERS WITH 2 5/8 INCH FACE DRIVING PULLEYS WITHOUT OUTSIDE BEARING

LENGTH OVER ALL

| NO. OF SPINDLES | 2 1/2 IN. GAUGE | 2 3/4 IN. GAUGE   | 3 IN. GAUGE  | 3 1/4 IN. GAUGE   | 3 1/2 IN. GAUGE | 4 IN. GAUGE   | 4 1/2 IN. GAUGE | 5 IN. GAUGE   | 5 1/2 IN. GAUGE | 6 IN. GAUGE  |
|-----------------|-----------------|-------------------|--------------|-------------------|-----------------|---------------|-----------------|---------------|-----------------|--------------|
| 40              | 6 ft. 4 in.     | 6 ft. 9 in.       | 7 ft. 2 in.  | 7 ft. 7 in.       | 8 ft. 0 in.     | 8 ft. 10 in.  | 9 ft. 8 in.     | 10 ft. 6 in.  | 11 ft. 4 in.    | 12 ft. 2 in. |
| 44              | 6 ft. 9 in.     | 7 ft. 2 3/4 in.   | 7 ft. 8 in.  | 8 ft. 1 3/4 in.   | 8 ft. 7 in.     | 9 ft. 6 in.   | 10 ft. 5 in.    | 11 ft. 4 in.  | 12 ft. 3 in.    | 13 ft. 2 in. |
| 48              | 7 ft. 2 in.     | 7 ft. 8 in.       | 8 ft. 2 in.  | 8 ft. 8 in.       | 9 ft. 2 in.     | 10 ft. 2 in.  | 11 ft. 2 in.    | 12 ft. 2 in.  | 13 ft. 2 in.    | 14 ft. 2 in. |
| 52              | 7 ft. 7 in.     | 8 ft. 1 3/4 in.   | 8 ft. 8 in.  | 9 ft. 2 3/4 in.   | 9 ft. 9 in.     | 10 ft. 10 in. | 11 ft. 11 in.   | 12 ft. 0 in.  | 14 ft. 1 in.    | 15 ft. 2 in. |
| 56              | 8 ft. 0 in.     | 8 ft. 7 in.       | 9 ft. 2 in.  | 9 ft. 9 in.       | 10 ft. 4 in.    | 11 ft. 6 in.  | 12 ft. 8 in.    | 13 ft. 10 in. | 15 ft. 0 in.    | 16 ft. 2 in. |
| 60              | 8 ft. 5 in.     | 9 ft. 0 3/4 in.   | 9 ft. 8 in.  | 10 ft. 3 3/4 in.  | 10 ft. 11 in.   | 12 ft. 2 in.  | 13 ft. 5 in.    | 14 ft. 8 in.  | 15 ft. 11 in.   | 17 ft. 2 in. |
| 64              | 8 ft. 10 in.    | 9 ft. 6 in.       | 10 ft. 2 in. | 10 ft. 10 in.     | 11 ft. 6 in.    | 12 ft. 10 in. | 14 ft. 2 in.    | 15 ft. 6 in.  | 16 ft. 10 in.   | 18 ft. 2 in. |
| 68              | 9 ft. 3 in.     | 9 ft. 11 3/4 in.  | 10 ft. 8 in. | 11 ft. 4 3/4 in.  | 12 ft. 1 in.    | 13 ft. 6 in.  | 14 ft. 11 in.   | 16 ft. 4 in.  | 17 ft. 9 in.    | 19 ft. 2 in. |
| 72              | 9 ft. 8 in.     | 10 ft. 5 in.      | 11 ft. 2 in. | 11 ft. 11 in.     | 12 ft. 8 in.    | 14 ft. 2 in.  | 15 ft. 8 in.    | 17 ft. 2 in.  | 18 ft. 8 in.    | 20 ft. 2 in. |
| 76              | 10 ft. 1 in.    | 10 ft. 10 3/4 in. | 11 ft. 8 in. | 12 ft. 5 3/4 in.  | 13 ft. 3 in.    | 14 ft. 10 in. | 16 ft. 5 in.    | 18 ft. 0 in.  | 19 ft. 7 in.    | 21 ft. 2 in. |
| 80              | 10 ft. 6 in.    | 11 ft. 4 in.      | 12 ft. 2 in. | 13 ft. 0 in.      | 13 ft. 10 in.   | 15 ft. 6 in.  | 17 ft. 2 in.    | 18 ft. 10 in. | 20 ft. 6 in.    | 22 ft. 2 in. |
| 84              | 10 ft. 11 in.   | 11 ft. 9 3/4 in.  | 12 ft. 8 in. | 13 ft. 6 3/4 in.  | 14 ft. 5 in.    | 16 ft. 2 in.  | 17 ft. 11 in.   | 19 ft. 8 in.  | 21 ft. 5 in.    | 23 ft. 2 in. |
| 88              | 11 ft. 4 in.    | 12 ft. 3 in.      | 13 ft. 2 in. | 14 ft. 1 in.      | 15 ft. 0 in.    | 16 ft. 10 in. | 18 ft. 8 in.    | 20 ft. 6 in.  | 22 ft. 4 in.    | 24 ft. 2 in. |
| 92              | 11 ft. 9 in.    | 12 ft. 8 3/4 in.  | 13 ft. 8 in. | 14 ft. 7 3/4 in.  | 15 ft. 7 in.    | 17 ft. 6 in.  | 19 ft. 5 in.    | 21 ft. 4 in.  | 23 ft. 3 in.    | 25 ft. 2 in. |
| 96              | 12 ft. 2 in.    | 13 ft. 2 in.      | 14 ft. 2 in. | 15 ft. 2 in.      | 16 ft. 2 in.    | 18 ft. 2 in.  | 20 ft. 2 in.    | 22 ft. 2 in.  | 24 ft. 2 in.    | 26 ft. 2 in. |
| 100             | 12 ft. 7 in.    | 13 ft. 7 3/4 in.  | 14 ft. 8 in. | 15 ft. 8 3/4 in.  | 16 ft. 9 in.    | 18 ft. 10 in. | 20 ft. 11 in.   | 23 ft. 0 in.  | 25 ft. 1 in.    | 27 ft. 2 in. |
| 104             | 13 ft. 0 in.    | 14 ft. 1 in.      | 15 ft. 2 in. | 16 ft. 3 in.      | 17 ft. 4 in.    | 19 ft. 6 in.  | 21 ft. 8 in.    | 23 ft. 10 in. | 26 ft. 0 in.    | 28 ft. 2 in. |
| 108             | 13 ft. 5 in.    | 14 ft. 6 3/4 in.  | 15 ft. 8 in. | 16 ft. 9 3/4 in.  | 17 ft. 11 in.   | 20 ft. 2 in.  | 22 ft. 5 in.    | 25 ft. 8 in.  | 26 ft. 11 in.   | 29 ft. 2 in. |
| 112             | 13 ft. 10 in.   | 15 ft. 0 in.      | 16 ft. 2 in. | 17 ft. 4 in.      | 18 ft. 6 in.    | 20 ft. 10 in. | 23 ft. 2 in.    | 25 ft. 6 in.  | 27 ft. 10 in.   | 30 ft. 2 in. |
| 116             | 14 ft. 3 in.    | 15 ft. 5 3/4 in.  | 16 ft. 8 in. | 17 ft. 10 3/4 in. | 19 ft. 1 in.    | 21 ft. 6 in.  | 23 ft. 11 in.   | 26 ft. 4 in.  | 28 ft. 9 in.    | 31 ft. 2 in. |
| 120             | 14 ft. 8 in.    | 15 ft. 11 in.     | 17 ft. 2 in. | 18 ft. 5 in.      | 19 ft. 8 in.    | 22 ft. 2 in.  | 24 ft. 8 in.    | 27 ft. 2 in.  | 29 ft. 8 in.    | 32 ft. 2 in. |
| 124             | 15 ft. 1 in.    | 16 ft. 4 3/4 in.  | 17 ft. 8 in. | 18 ft. 11 3/4 in. | 20 ft. 3 in.    | 22 ft. 10 in. | 25 ft. 5 in.    | 28 ft. 0 in.  | 30 ft. 7 in.    | 33 ft. 2 in. |
| 128             | 15 ft. 6 in.    | 16 ft. 10 in.     | 18 ft. 2 in. | 19 ft. 6 in.      | 20 ft. 10 in.   | 23 ft. 6 in.  | 26 ft. 2 in.    | 28 ft. 10 in. | 31 ft. 6 in.    | 34 ft. 2 in. |
| 132             | 15 ft. 11 in.   | 17 ft. 3 3/4 in.  | 18 ft. 8 in. | 20 ft. 0 3/4 in.  | 21 ft. 5 in.    | 24 ft. 2 in.  | 26 ft. 11 in.   | 29 ft. 8 in.  | 32 ft. 5 in.    | 35 ft. 2 in. |
| 136             | 16 ft. 4 in.    | 17 ft. 9 in.      | 19 ft. 2 in. | 20 ft. 7 in.      | 22 ft. 0 in.    | 24 ft. 10 in. | 27 ft. 8 in.    | 30 ft. 6 in.  | 33 ft. 4 in.    | 36 ft. 2 in. |

FOR ADDITIONS TO THE ABOVE LENGTHS SEE NOTES AT END OF TABLE

# LENGTH TABLE—(Continued)

LENGTH OF TWISTERS WITH 2 <sup>5</sup>/<sub>8</sub> INCH FACE DRIVING PULLEYS WITHOUT OUTSIDE BEARING

LENGTH OVER ALL

| NO. OF SPINDLES | 2 <sup>1</sup> / <sub>2</sub> IN. GAUGE | 2 <sup>3</sup> / <sub>4</sub> IN. GAUGE   | 3 IN. GAUGE  | 3 <sup>1</sup> / <sub>4</sub> IN. GAUGE   | 3 <sup>1</sup> / <sub>2</sub> IN. GAUGE | 4 IN. GAUGE   | 4 <sup>1</sup> / <sub>2</sub> IN. GAUGE | 5 IN. GAUGE   | 5 <sup>1</sup> / <sub>2</sub> IN. GAUGE | 6 IN. GAUGE  |
|-----------------|---|---|--------------|---|---|---------------|---|---------------|---|--------------|
| 140             | 16 ft. 9 in.                            | 18 ft. 2 <sup>3</sup> / <sub>4</sub> in.  | 19 ft. 8 in. | 21 ft. 1 <sup>1</sup> / <sub>2</sub> in.  | 22 ft. 7 in.                            | 25 ft. 6 in.  | 28 ft. 6 in.                            | 31 ft. 4 in.  | 34 ft. 3 in.                            | 37 ft. 2 in. |
| 144             | 17 ft. 2 in.                            | 18 ft. 8 in.                              | 20 ft. 2 in. | 21 ft. 8 in.                              | 23 ft. 2 in.                            | 26 ft. 2 in.  | 29 ft. 2 in.                            | 32 ft. 2 in.  | 35 ft. 2 in.                            | 38 ft. 2 in. |
| 148             | 17 ft. 7 in.                            | 19 ft. 1 <sup>1</sup> / <sub>2</sub> in.  | 20 ft. 8 in. | 22 ft. 2 <sup>3</sup> / <sub>4</sub> in.  | 23 ft. 9 in.                            | 26 ft. 10 in. | 29 ft. 11 in.                           | 33 ft. 0 in.  | 36 ft. 1 in.                            | 39 ft. 2 in. |
| 152             | 18 ft. 0 in.                            | 19 ft. 7 in.                              | 21 ft. 2 in. | 22 ft. 9 in.                              | 24 ft. 4 in.                            | 27 ft. 6 in.  | 30 ft. 8 in.                            | 33 ft. 10 in. | 37 ft. 0 in.                            | 40 ft. 2 in. |
| 156             | 18 ft. 5 in.                            | 20 ft. 0 <sup>1</sup> / <sub>2</sub> in.  | 21 ft. 8 in. | 23 ft. 3 <sup>3</sup> / <sub>4</sub> in.  | 24 ft. 11 in.                           | 28 ft. 2 in.  | 31 ft. 5 in.                            | 34 ft. 8 in.  | 37 ft. 11 in.                           | 41 ft. 2 in. |
| 160             | 18 ft. 10 in.                           | 20 ft. 6 in.                              | 22 ft. 2 in. | 23 ft. 10 in.                             | 25 ft. 6 in.                            | 28 ft. 10 in. | 32 ft. 2 in.                            | 35 ft. 6 in.  | 38 ft. 10 in.                           |              |
| 164             | 19 ft. 3 in.                            | 20 ft. 1 <sup>1</sup> / <sub>2</sub> in.  | 22 ft. 8 in. | 24 ft. 4 <sup>1</sup> / <sub>2</sub> in.  | 26 ft. 1 in.                            | 29 ft. 6 in.  | 32 ft. 11 in.                           | 36 ft. 4 in.  | 39 ft. 9 in.                            |              |
| 168             | 19 ft. 8 in.                            | 21 ft. 5 in.                              | 23 ft. 2 in. | 24 ft. 11 in.                             | 26 ft. 8 in.                            | 30 ft. 2 in.  | 33 ft. 8 in.                            | 37 ft. 2 in.  | 40 ft. 8 in.                            |              |
| 172             | 20 ft. 1 in.                            | 21 ft. 10 <sup>1</sup> / <sub>2</sub> in. | 23 ft. 8 in. | 25 ft. 5 <sup>1</sup> / <sub>2</sub> in.  | 27 ft. 3 in.                            | 30 ft. 10 in. | 34 ft. 5 in.                            | 38 ft. 0 in.  | 41 ft. 7 in.                            |              |
| 176             | 20 ft. 6 in.                            | 22 ft. 4 in.                              | 24 ft. 2 in. | 26 ft. 0 in.                              | 27 ft. 10 in.                           | 31 ft. 6 in.  | 35 ft. 2 in.                            | 38 ft. 10 in. | 42 ft. 6 in.                            |              |
| 180             | 20 ft. 11 in.                           | 22 ft. 9 <sup>1</sup> / <sub>2</sub> in.  | 24 ft. 8 in. | 26 ft. 6 <sup>1</sup> / <sub>2</sub> in.  | 28 ft. 5 in.                            | 32 ft. 2 in.  | 35 ft. 11 in.                           | 39 ft. 8 in.  |   |              |
| 184             | 21 ft. 4 in.                            | 23 ft. 3 in.                              | 25 ft. 2 in. | 27 ft. 1 in.                              | 29 ft. 0 in.                            | 32 ft. 10 in. | 36 ft. 8 in.                            | 40 ft. 6 in.  |   |              |
| 188             | 21 ft. 9 in.                            | 23 ft. 8 <sup>1</sup> / <sub>2</sub> in.  | 25 ft. 8 in. | 27 ft. 7 <sup>1</sup> / <sub>2</sub> in.  | 29 ft. 7 in.                            | 33 ft. 6 in.  | 37 ft. 5 in.                            | 41 ft. 4 in.  |   |              |
| 192             | 22 ft. 2 in.                            | 24 ft. 2 in.                              | 26 ft. 2 in. | 28 ft. 2 in.                              | 30 ft. 2 in.                            | 34 ft. 2 in.  | 38 ft. 2 in.                            | 42 ft. 2 in.  |   |              |
| 196             | 22 ft. 7 in.                            | 24 ft. 7 <sup>1</sup> / <sub>2</sub> in.  | 26 ft. 8 in. | 28 ft. 8 <sup>1</sup> / <sub>2</sub> in.  | 30 ft. 9 in.                            | 34 ft. 10 in. | 38 ft. 11 in.                           | 43 ft. 0 in.  |   |              |
| 200             | 23 ft. 0 in.                            | 25 ft. 1 in.                              | 27 ft. 2 in. | 29 ft. 3 in.                              | 31 ft. 4 in.                            | 35 ft. 6 in.  | 39 ft. 8 in.                            |               |   |              |
| 204             | 23 ft. 5 in.                            | 25 ft. 6 <sup>1</sup> / <sub>2</sub> in.  | 27 ft. 8 in. | 29 ft. 9 <sup>1</sup> / <sub>2</sub> in.  | 31 ft. 11 in.                           | 36 ft. 2 in.  | 40 ft. 5 in.                            |               |   |              |
| 208             | 23 ft. 10 in.                           | 26 ft. 0 in.                              | 28 ft. 2 in. | 30 ft. 4 in.                              | 32 ft. 6 in.                            | 36 ft. 10 in. | 41 ft. 2 in.                            |               |   |              |
| 212             | 24 ft. 3 in.                            | 26 ft. 5 <sup>1</sup> / <sub>2</sub> in.  | 28 ft. 8 in. | 30 ft. 10 <sup>1</sup> / <sub>2</sub> in. | 33 ft. 1 in.                            | 37 ft. 6 in.  | 41 ft. 11 in.                           |               |   |              |
| 216             | 24 ft. 8 in.                            | 26 ft. 11 in.                             | 29 ft. 2 in. | 31 ft. 5 in.                              | 33 ft. 8 in.                            | 38 ft. 2 in.  | 42 ft. 8 in.                            |               |   |              |
| 220             | 25 ft. 1 in.                            | 27 ft. 4 <sup>1</sup> / <sub>2</sub> in.  | 29 ft. 8 in. | 31 ft. 11 <sup>1</sup> / <sub>2</sub> in. | 34 ft. 3 in.                            | 38 ft. 10 in. |   |               |   |              |
| 224             | 25 ft. 6 in.                            | 27 ft. 10 in.                             | 30 ft. 2 in. | 32 ft. 6 in.                              | 34 ft. 10 in.                           | 39 ft. 6 in.  |   |               |   |              |
| 228             | 25 ft. 11 in.                           | 28 ft. 3 <sup>3</sup> / <sub>4</sub> in.  | 30 ft. 8 in. | 33 ft. 0 <sup>1</sup> / <sub>2</sub> in.  | 35 ft. 5 in.                            | 40 ft. 2 in.  |   |               |   |              |
| 232             | 26 ft. 4 in.                            | 28 ft. 9 in.                              | 31 ft. 2 in. | 33 ft. 7 in.                              | 36 ft. 0 in.                            | 40 ft. 10 in. |   |               |   |              |
| 236             | 26 ft. 9 in.                            | 29 ft. 2 <sup>1</sup> / <sub>2</sub> in.  | 31 ft. 8 in. | 34 ft. 1 <sup>1</sup> / <sub>2</sub> in.  | 36 ft. 7 in.                            | 41 ft. 6 in.  |   |               |   |              |

FOR ADDITIONS TO THE ABOVE LENGTHS SEE NOTES AT END OF TABLE



# LENGTH TABLE—(Continued)

## LENGTH OF TWISTERS WITH 2½ INCH FACE DRIVING PULLEYS WITHOUT OUTSIDE BEARING

### ADDITIONS TO LENGTHS GIVEN IN TABLE

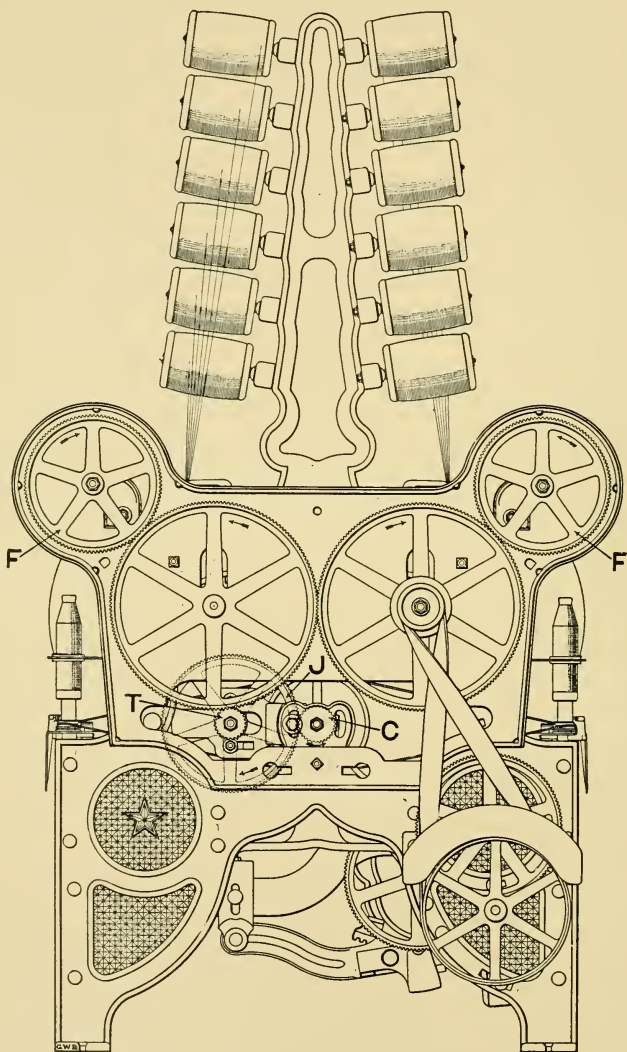
Twisters, AMERICAN SYSTEM, wet or dry:—  
 Without Outside Bearing,  
 3½ inch face Driving Pulleys, add 1 inch.  
 With Outside Bearing,  
 2½ or 3½ inch face Driving Pulleys, with 13½ inch  
 Outrigger Brackets and 4½ in. Box, add 5½ inches.  
 3½ inch face Driving Pulleys, with 14½ inch  
 Outrigger Brackets and 4½ in. Box, add 6½ inches.  
 4½ inch face Driving Pulleys, with 15½ inch  
 Outrigger Brackets and 4½ in. Box, add 7½ inches.

Twisters, SCOTCH SYSTEM, wet only:—  
 This Style of Twister is 1 inch longer in all  
 cases, than the American Style.

### LENGTH OVER ALL

| NO. OF SPINDLES | 2½ IN. GAUGE  | 2¾ IN. GAUGE   | 3 IN. GAUGE  | 3¼ IN. GAUGE  | 3½ IN. GAUGE  |
|-----------------|---------------|----------------|--------------|---------------|---------------|
| 240             | 27 ft. 2 in.  | 29 ft. 8 in.   | 32 ft. 2 in. | 34 ft. 8 in.  | 37 ft. 2 in.  |
| 244             | 27 ft. 7 in.  | 30 ft. 1¼ in.  | 32 ft. 8 in. | 35 ft. 2½ in. | 37 ft. 9 in.  |
| 248             | 28 ft. 0 in.  | 30 ft. 7 in.   | 33 ft. 2 in. | 35 ft. 9 in.  | 38 ft. 4 in.  |
| 252             | 28 ft. 5 in.  | 31 ft. 0¼ in.  | 33 ft. 8 in. | 36 ft. 3¼ in. | 38 ft. 11 in. |
| 256             | 28 ft. 10 in. | 31 ft. 6 in.   | 34 ft. 2 in. | 36 ft. 10 in. | 39 ft. 6 in.  |
| 260             | 29 ft. 3 in.  | 31 ft. 11¼ in. | 34 ft. 8 in. | 37 ft. 4½ in. | 40 ft. 1 in.  |
| 264             | 29 ft. 8 in.  | 32 ft. 5 in.   | 35 ft. 2 in. | 37 ft. 11 in. | 40 ft. 8 in.  |
| 268             | 30 ft. 1 in.  | 32 ft. 10¼ in. | 35 ft. 8 in. | 38 ft. 5½ in. | 41 ft. 3 in.  |
| 272             | 30 ft. 6 in.  | 33 ft. 4 in.   | 36 ft. 2 in. | 39 ft. 0 in.  | 41 ft. 10 in. |
| 276             | 30 ft. 11 in. | 33 ft. 9 in.   | 36 ft. 8 in. | 39 ft. 6 in.  | 42 ft. 5 in.  |
| 280             | 31 ft. 4 in.  | 34 ft. 3 in.   | 37 ft. 2 in. | 40 ft. 1 in.  |               |
| 284             | 31 ft. 9 in.  | 34 ft. 8 in.   | 37 ft. 8 in. | 40 ft. 7 in.  |               |
| 288             | 32 ft. 2 in.  | 35 ft. 2 in.   | 38 ft. 2 in. | 41 ft. 2 in.  |               |
| 292             | 32 ft. 7 in.  | 35 ft. 7 in.   | 38 ft. 8 in. | 41 ft. 8 in.  |               |
| 296             | 33 ft. 0 in.  | 36 ft. 1 in.   | 39 ft. 2 in. | 42 ft. 3 in.  |               |
| 300             | 33 ft. 5 in.  | 36 ft. 6 in.   | 39 ft. 8 in. |               |               |
| 304             | 33 ft. 10 in. | 37 ft. 0 in.   | 40 ft. 2 in. |               |               |
| 308             | 34 ft. 3 in.  | 37 ft. 5 in.   | 40 ft. 8 in. |               |               |
| 312             | 34 ft. 8 in.  | 37 ft. 11 in.  | 41 ft. 2 in. |               |               |
| 316             | 35 ft. 1 in.  | 38 ft. 4 in.   | 41 ft. 8 in. |               |               |
| 320             | 35 ft. 6 in.  | 38 ft. 10 in.  |              |               |               |
| 324             | 35 ft. 11 in. | 39 ft. 3 in.   |              |               |               |
| 328             | 36 ft. 4 in.  | 39 ft. 9 in.   |              |               |               |
| 332             | 36 ft. 9 in.  | 40 ft. 2 in.   |              |               |               |
| 336             | 37 ft. 2 in.  | 40 ft. 8 in.   |              |               |               |
| 340             | 37 ft. 7 in.  | 41 ft. 1 in.   |              |               |               |

# TWIST GEARING FOR TWISTING



**HEAD END SHOWING TWIST GEARING  
AMERICAN SYSTEM**

# TWIST FORMULAS

## SINGLE CYLINDER AMERICAN TWISTER

**C**=CYLINDER GEAR.

**J**=JACK GEAR.

**T**=TWIST CHANGE GEAR.

**F**=FRONT ROLL GEAR.

**O**=CIRCUM. OF FRONT ROLL.

**R**=RATIO CYL. TO WHIRL.

$$\frac{J \times F \times R}{C \times T \times O} = \text{TWIST PER INCH.}$$

$$\frac{J \times F \times R}{C \times O} = \text{TWIST CONSTANT.}$$

$$\frac{\text{TWIST CONSTANT}}{\text{TWIST CHANGE GEAR}} = \text{TWIST PER INCH.}$$

$$\frac{\text{TWIST CONSTANT}}{\text{TWIST PER INCH}} = \text{TWIST CHANGE GEAR.}$$

### EXAMPLES:—

CYLINDER GEAR 60 T.

JACK GEAR 80 T.

TWIST CHANGE GEAR 16 T.

FRONT ROLL GEAR 112 T.

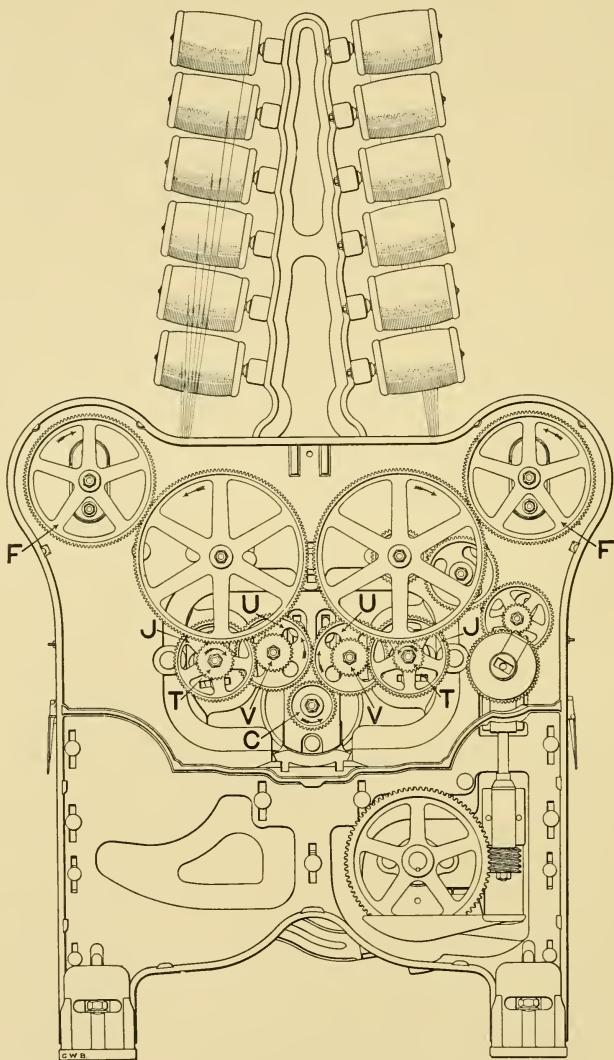
CIRCUM.  $1\frac{1}{2}$ " FRONT ROLL 4.7124". RATIO 7" CYL. TO 1" WHIRL 6.18.

$$\frac{80 \times 112 \times 6.18}{60 \times 16 \times 4.7124} = 12.24, \text{ TWIST PER INCH.}$$

$$\frac{80 \times 112 \times 6.18}{60 \times 4.7124} = 195.84, \text{ TWIST CONSTANT.}$$

$$\frac{195.84}{16} = 12.24, \text{ TWIST PER INCH.}$$

$$\frac{195.84}{12.24} = 16, \text{ TWIST CHANGE GEAR.}$$



**BOX-HEAD SHOWING TWIST GEARING  
ALSO BUILDER MCTION GEARING  
AMERICAN SYSTEM**

# TWIST FORMULAS

SINGLE CYLINDER BOX-HEAD AMERICAN TWISTER

**C**=CYLINDER GEAR.

**U**=UNIVERSAL JACK GEAR.

**V**=VARIABLE CYLINDER GEAR. **J**=JACK GEAR.

**T**=TWIST CHANGE GEAR.

**F**=FRONT ROLL GEAR.

**O**=CIRCUM. OF FRONT ROLL.

**R**=RATIO CYL. TO WHIRL.

$$\frac{U \times J \times F \times R}{C \times V \times T \times O} = \text{TWIST PER INCH.}$$

$$\frac{U \times J \times F \times R}{C \times V \times O} = \text{TWIST CONSTANT.}$$

$$\frac{\text{TWIST CONSTANT}}{\text{TWIST CHANGE GEAR}} = \text{TWIST PER INCH.}$$

$$\frac{\text{TWIST CONSTANT}}{\text{TWIST PER INCH}} = \text{TWIST CHANGE GEAR.}$$

## EXAMPLES:—

CYLINDER GEAR 52 T.

UNIVERSAL JACK GEAR 64 T.

VARIABLE CYLINDER GEAR 60 T.

JACK GEAR 65 T.

TWIST CHANGE GEAR 16 T.

FRONT ROLL GEAR 112 T.

CIRCUM. 1½" FRONT ROLL 4.7124".

RATIO 7" CYL. TO 1" WHIRL 6.18.

$$\frac{64 \times 65 \times 112 \times 6.18}{52 \times 60 \times 16 \times 4.7124} = 12.24, \text{ TWIST PER INCH.}$$

$$\frac{64 \times 65 \times 112 \times 6.18}{52 \times 60 \times 4.7124} = 195.84, \text{ TWIST CONSTANT.}$$

$$\frac{195.84}{16} = 12.24, \text{ TWIST PER INCH.}$$

$$\frac{195.84}{12.24} = 16, \text{ TWIST CHANGE GEAR.}$$

## BOX-HEAD GEARING

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### TWIST GEARING

All the twist gearing tables given in this book are applicable to the new box-head twister as well as to the old type twister. By referring, however, to the two preceding pages it will be seen, first, that the arrangement of the twist gearing differs from that of the old type twister, and secondly, that the formulas given for each are different. The new twister has compound twist gearing which, as will be noted by reference to the preceding cut, can be easily arranged to gear each side of the twister independently. This compound gearing is designed to give a wide range of twist, and thus meet the present requirements in twisting. By the use of the regular change gears only, a very large variation in twist may be obtained, since the cylinder gear C may be varied from 26 to 52 teeth, the variable cylinder gear V from 18 to 60 or 70 teeth depending upon the width of twister, and the regular twist change gear T from 16 to 60 teeth.

The actual difference between the old type twister, for which the twist gearing tables were originally intended, and the new box-head twister is that, in place of the cylinder gear C and the jack gear J, we now have the cylinder gear C, the universal jack gear U, the variable cylinder gear V and the jack gear J. Now in selecting the proper gearing to match the twist of the old type twister, we use the same gears for the variable cylinder gear V that are given in the tables for the regular cylinder gear, so that the jack gear J of the old type twister must have an equivalent in the cylinder gear C, the universal jack gear U, and the jack gear J of the new box-head twister or, stated in the terms of the two twist formulas,

$$\text{Jack J} = \frac{\text{Universal Jack U} \times \text{Jack J}}{\text{Cylinder C}}$$

The following list shows the equivalent gearing which will produce the twist per inch given in the tables:

For 36 inch and 39 inch twisters:

$$\text{Jack 80 T} = \frac{\text{Universal Jack 64 T} \times \text{Jack 65 T}}{\text{Cylinder 52 T}}$$

$$\text{Jack 96 T} = \frac{\text{Universal Jack 64 T} \times \text{Jack 66 T}}{\text{Cylinder 44 T}}$$

$$\text{Jack 112 T} = \frac{\text{Universal Jack 64 T} \times \text{Jack 70 T}}{\text{Cylinder 40 T}}$$

$$\text{Jack 120 T} = \frac{\text{Universal Jack 64 T} \times \text{Jack 75 T}}{\text{Cylinder 40 T}}$$

For 42 inch twisters:

$$\text{Jack 96 T} = \frac{\text{Universal Jack 72 T} \times \text{Jack 68 T}}{\text{Cylinder 51 T}}$$

$$\text{Jack 112 T} = \frac{\text{Universal Jack 72 T} \times \text{Jack 70 T}}{\text{Cylinder 45 T}}$$

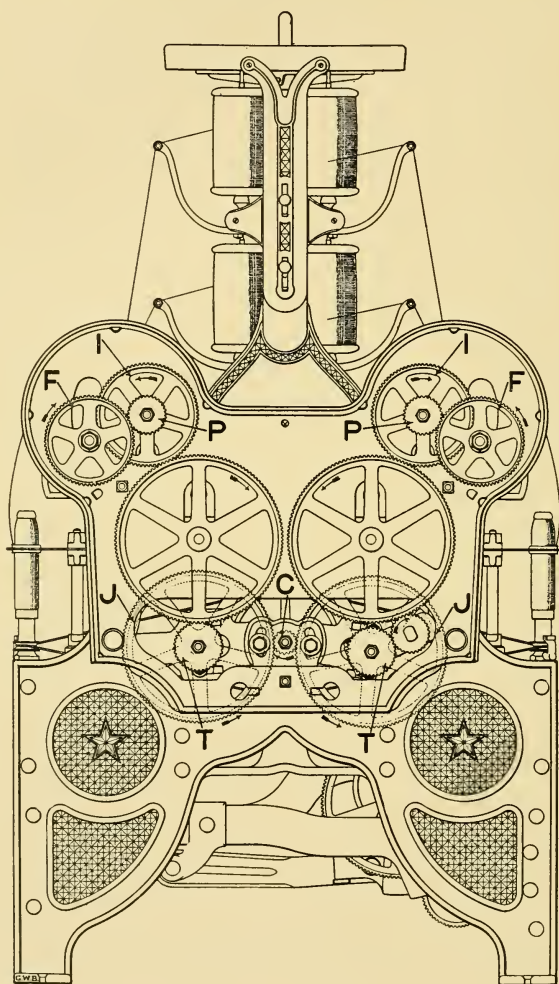
$$\text{Jack 120 T} = \frac{\text{Universal Jack 72 T} \times \text{Jack 75 T}}{\text{Cylinder 45 T}}$$

$$\text{Jack 132 T} = \frac{\text{Universal Jack 72 T} \times \text{Jack 77 T}}{\text{Cylinder 42 T}}$$

### LAY GEAR

The lay gear or builder motion change gear, as will be noted by reference to the preceding cut, is much more conveniently located than on the older type of twister, being enclosed in the upper right hand part of the head with the twist gearing. This gear, which is the same as a cylinder gear or a twist change gear, may be varied from 16 to 60 teeth according to requirements.





HEAD END SHOWING TWIST GEARING  
SCOTCH SYSTEM

CUT SHOWS VERTICAL OR SPINNING STYLE CREEL



# TWIST FORMULAS

## SINGLE CYLINDER SCOTCH TWISTER

C=CYLINDER GEAR.

J=JACK GEAR.

T=TWIST CHANGE GEAR.

I=INTERMEDIATE ROLL GEAR.

P=PINION.

F=FRONT ROLL GEAR.

O=CIRCUM.OF FRONT ROLL.

R=RATIO CYL. TO WHIRL.

$$\frac{J \times I \times F \times R}{C \times T \times P \times O} = \text{TWIST PER INCH.}$$

$$\frac{J \times I \times F \times R}{C \times P \times O} = \text{TWIST CONSTANT.}$$

$$\frac{\text{TWIST CONSTANT}}{\text{TWIST CHANGE GEAR}} = \text{TWIST PER INCH.}$$

$$\frac{\text{TWIST CONSTANT}}{\text{TWIST PER INCH}} = \text{TWIST CHANGE GEAR.}$$

### EXAMPLES:—

CYLINDER GEAR 60 T.

JACK GEAR 80 T.

TWIST CHANGE GEAR 16 T.

INTERMEDIATE JACK GEAR 80 T.

PINION 30 T.

FRONT ROLL GEAR 70 T.

CIRCUM. OF 2½" FRONT ROLL 7.854".

RATIO 7" CYL. TO 1" WHIRL 6.18.

$$\frac{80 \times 80 \times 70 \times 6.18}{60 \times 16 \times 30 \times 7.854} = 12.24, \text{ TWIST PER INCH.}$$

$$\frac{80 \times 80 \times 70 \times 6.18}{60 \times 30 \times 7.854} = 195.84, \text{ TWIST CONSTANT.}$$

$$\frac{195.84}{16} = 12.24, \text{ TWIST PER INCH.}$$

$$\frac{195.84}{12.24} = 16, \text{ TWIST CHANGE GEAR.}$$

The TWIST TABLES for the SINGLE CYLINDER SCOTCH TWISTER are the same as for the American Twister.

The gearing of the Scotch Twister is so arranged that, with the same Cylinder, Whirl, Cylinder Gear, Jack Gear and Twist Gear, the same twist is produced as on the American Twister; that is, the 2½ inch Roll of the Scotch Twister with 30 tooth Pinion, 80 tooth Intermediate Roll Gear and 70 tooth Front Roll Gear is equal to the 1½ inch Roll of the American Twister with 112 tooth Front Roll Gear.

# TWIST GEARING TABLE

36" AND 39" TWISTERS

CYLINDER 7 INCHES DIAM.

WHIRL 1 INCH DIAM.

RATIO OF CYLINDER TO WHIRL 1 TO 618

FRONT ROLL 1½ INCHES DIAM.

FRONT ROLL GEAR 112 TEETH

| Change<br>Gears | TWIST PER INCH |            |            |            |            |            |
|-----------------|----------------|------------|------------|------------|------------|------------|
|                 | Cyl. 60 T.     | Cyl. 50 T. | Cyl. 40 T. | Cyl. 40 T. | Cyl. 36 T. | Cyl. 30 T. |
|                 | Jack 80 T.     | Jack 80 T. | Jack 80 T. | Jack 96 T. | Jack 96 T. | Jack 96 T. |
| 16              | 12.24          | 14.69      | 18.36      | 22.03      | 24.48      | 29.38      |
| 17              | 11.52          | 13.82      | 17.28      | 20.74      | 23.04      | 27.65      |
| 18              | 10.88          | 13.06      | 16.32      | 19.58      | 21.76      | 26.11      |
| 19              | 10.31          | 12.37      | 15.46      | 18.55      | 20.61      | 24.74      |
| 20              | 9.79           | 11.75      | 14.69      | 17.63      | 19.58      | 23.50      |
| 21              | 9.33           | 11.19      | 13.99      | 16.79      | 18.65      | 22.38      |
| 22              | 8.90           | 10.68      | 13.35      | 16.02      | 17.80      | 21.36      |
| 23              | 8.51           | 10.22      | 12.77      | 15.33      | 17.03      | 20.44      |
| 24              | 8.16           | 9.79       | 12.24      | 14.69      | 16.32      | 19.58      |
| 25              | 7.83           | 9.40       | 11.75      | 14.10      | 15.67      | 18.80      |
| 26              | 7.53           | 9.04       | 11.30      | 13.56      | 15.06      | 18.08      |
| 27              | 7.25           | 8.70       | 10.88      | 13.06      | 14.51      | 17.40      |
| 28              | 6.99           | 8.39       | 10.49      | 12.59      | 13.99      | 16.78      |
| 29              | 6.75           | 8.10       | 10.13      | 12.16      | 13.51      | 16.20      |
| 30              | 6.53           | 7.83       | 9.79       | 11.75      | 13.06      | 15.67      |
| 31              | 6.32           | 7.58       | 9.48       | 11.37      | 12.63      | 15.16      |
| 32              | 6.12           | 7.34       | 9.18       | 11.02      | 12.24      | 14.68      |
| 33              | 5.93           | 7.12       | 8.90       | 10.68      | 11.87      | 14.24      |
| 34              | 5.76           | 6.91       | 8.64       | 10.37      | 11.52      | 13.82      |
| 35              | 5.60           | 6.71       | 8.39       | 10.07      | 11.19      | 13.43      |
| 36              | 5.44           | 6.53       | 8.16       | 9.79       | 10.88      | 13.06      |
| 37              | 5.29           | 6.35       | 7.94       | 9.53       | 10.59      | 12.70      |
| 38              | 5.15           | 6.18       | 7.73       | 9.28       | 10.31      | 12.36      |
| 39              | 5.02           | 6.03       | 7.53       | 9.04       | 10.04      | 12.06      |
| 40              | 4.90           | 5.88       | 7.34       | 8.81       | 9.79       | 11.75      |
| 41              | 4.78           | 5.73       | 7.16       | 8.60       | 9.55       | 11.46      |
| 42              | 4.66           | 5.60       | 6.99       | 8.39       | 9.33       | 11.20      |
| 43              | 4.55           | 5.47       | 6.83       | 8.20       | 9.11       | 10.94      |
| 44              | 4.45           | 5.34       | 6.68       | 8.01       | 8.90       | 10.68      |
| 45              | 4.35           | 5.22       | 6.53       | 7.83       | 8.70       | 10.44      |
| 46              | 4.26           | 5.11       | 6.39       | 7.66       | 8.51       | 10.22      |
| 47              | 4.17           | 5.00       | 6.25       | 7.50       | 8.33       | 10.00      |
| 48              | 4.08           | 4.90       | 6.12       | 7.34       | 8.16       | 9.80       |
| 49              | 4.00           | 4.80       | 6.00       | 7.19       | 7.99       | 9.66       |
| 50              | 3.92           | 4.70       | 5.88       | 7.05       | 7.83       | 9.40       |
| 51              | 3.84           | 4.61       | 5.76       | 6.91       | 7.68       | 9.22       |
| 52              | 3.77           | 4.52       | 5.65       | 6.78       | 7.53       | 9.04       |
| 53              | 3.70           | 4.43       | 5.54       | 6.65       | 7.39       | 8.87       |
| 54              | 3.63           | 4.35       | 5.44       | 6.53       | 7.25       | 8.70       |
| 55              | 3.56           | 4.27       | 5.34       | 6.41       | 7.12       | 8.55       |
| 56              | 3.50           | 4.20       | 5.25       | 6.29       | 6.99       | 8.39       |
| 57              | 3.44           | 4.12       | 5.15       | 6.18       | 6.87       | 8.25       |
| 58              | 3.38           | 4.05       | 5.06       | 6.08       | 6.75       | 8.10       |
| 59              | 3.32           | 3.98       | 4.98       | 5.97       | 6.64       | 7.97       |
| 60              | 3.26           | 3.92       | 4.90       | 5.88       | 6.53       | 7.83       |
| Constants       | 195.84         | 235.01     | 293.76     | 352.51     | 391.68     | 470.02     |

# TWIST GEARING TABLE FOR TWISTING

## TWIST GEARING TABLE—(Continued)

36" AND 39" TWISTERS

**CYLINDER 7 INCHES DIAM.      WHIRL 1 INCH DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 6.18

FRONT ROLL  $1\frac{1}{2}$  INCHES DIAM.      FRONT ROLL GEAR 112 TEETH

| Change<br>Gears | TWIST PER INCH |             |             |             |             |             |
|-----------------|----------------|-------------|-------------|-------------|-------------|-------------|
|                 | Cyl. 30 T.     | Cyl. 27 T.  | Cyl. 24 T.  | Cyl. 24 T.  | Cyl. 21 T.  | Cyl. 18 T.  |
|                 | Jack 112 T.    | Jack 112 T. | Jack 112 T. | Jack 120 T. | Jack 120 T. | Jack 120 T. |
| 16              | 34.27          | 38.08       | 42.84       | 45.90       | 52.46       | 61.20       |
| 17              | 32.26          | 35.84       | 40.32       | 43.20       | 49.37       | 57.60       |
| 18              | 30.46          | 33.85       | 38.08       | 40.80       | 46.63       | 54.40       |
| 19              | 28.86          | 32.07       | 36.08       | 38.65       | 44.17       | 51.54       |
| 20              | 27.42          | 30.46       | 34.27       | 36.72       | 41.97       | 48.96       |
| 21              | 26.11          | 29.01       | 32.64       | 34.97       | 39.97       | 46.63       |
| 22              | 24.92          | 27.69       | 31.16       | 33.38       | 38.15       | 44.51       |
| 23              | 23.84          | 26.49       | 29.80       | 31.93       | 36.49       | 42.57       |
| 24              | 22.85          | 25.39       | 28.56       | 30.60       | 34.97       | 40.80       |
| 25              | 21.93          | 24.37       | 27.42       | 29.38       | 33.57       | 39.17       |
| 26              | 21.09          | 23.43       | 26.36       | 28.25       | 32.28       | 37.66       |
| 27              | 20.30          | 22.57       | 25.39       | 27.20       | 31.09       | 36.27       |
| 28              | 19.58          | 21.76       | 24.48       | 26.23       | 29.98       | 34.97       |
| 29              | 18.91          | 21.01       | 23.64       | 25.32       | 28.94       | 33.77       |
| 30              | 18.28          | 20.31       | 22.85       | 24.48       | 27.98       | 32.64       |
| 31              | 17.69          | 19.65       | 22.11       | 23.69       | 27.07       | 31.59       |
| 32              | 17.14          | 19.04       | 21.42       | 22.95       | 26.23       | 30.60       |
| 33              | 16.62          | 18.46       | 20.77       | 22.25       | 25.43       | 29.67       |
| 34              | 16.13          | 17.92       | 20.16       | 21.60       | 24.69       | 28.80       |
| 35              | 15.67          | 17.41       | 19.58       | 20.98       | 23.98       | 27.98       |
| 36              | 15.23          | 16.92       | 19.04       | 20.40       | 23.31       | 27.20       |
| 37              | 14.82          | 16.47       | 18.53       | 19.85       | 22.68       | 26.46       |
| 38              | 14.43          | 16.03       | 18.04       | 19.33       | 22.09       | 25.77       |
| 39              | 14.06          | 15.62       | 17.58       | 18.83       | 21.52       | 25.11       |
| 40              | 13.71          | 15.23       | 17.14       | 18.36       | 20.98       | 24.48       |
| 41              | 13.37          | 14.86       | 16.72       | 17.91       | 20.47       | 23.88       |
| 42              | 13.05          | 14.51       | 16.32       | 17.49       | 19.98       | 23.31       |
| 43              | 12.75          | 14.17       | 15.94       | 17.08       | 19.52       | 22.77       |
| 44              | 12.46          | 13.85       | 15.58       | 16.69       | 19.08       | 22.25       |
| 45              | 12.19          | 13.54       | 15.23       | 16.32       | 18.65       | 21.76       |
| 46              | 11.92          | 13.25       | 14.90       | 15.97       | 18.25       | 21.29       |
| 47              | 11.67          | 12.96       | 14.58       | 15.63       | 17.86       | 20.83       |
| 48              | 11.42          | 12.69       | 14.28       | 15.30       | 17.49       | 20.40       |
| 49              | 11.19          | 12.43       | 13.99       | 14.99       | 17.13       | 19.98       |
| 50              | 10.97          | 12.19       | 13.71       | 14.69       | 16.79       | 19.58       |
| 51              | 10.75          | 11.95       | 13.44       | 14.40       | 16.46       | 19.20       |
| 52              | 10.55          | 11.72       | 13.18       | 14.12       | 16.14       | 18.83       |
| 53              | 10.35          | 11.50       | 12.93       | 13.86       | 15.84       | 18.48       |
| 54              | 10.15          | 11.28       | 12.69       | 13.60       | 15.54       | 18.13       |
| 55              | 9.97           | 11.08       | 12.46       | 13.35       | 15.26       | 17.80       |
| 56              | 9.79           | 10.88       | 12.24       | 13.11       | 14.99       | 17.49       |
| 57              | 9.62           | 10.69       | 12.03       | 12.88       | 14.72       | 17.18       |
| 58              | 9.45           | 10.50       | 11.82       | 12.66       | 14.47       | 16.88       |
| 59              | 9.29           | 10.33       | 11.62       | 12.45       | 14.23       | 16.60       |
| 60              | 9.14           | 10.15       | 11.42       | 12.24       | 13.99       | 16.32       |
| Constants       | 548.35         | 609.28      | 685.44      | 734.40      | 839.32      | 979.20      |

# TWIST GEARING TABLE FOR TWISTING

## TWIST GEARING TABLE

36" AND 39" TWISTERS

**CYLINDER 7 INCHES DIAM. WHIRL  $1\frac{1}{8}$  INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 5.61

FRONT ROLL  $1\frac{1}{2}$  INCHES DIAM. FRONT ROLL GEAR 112 TEETH

| Change<br><br>Gears | TWIST PER INCH |            |            |            |            |            |
|---------------------|----------------|------------|------------|------------|------------|------------|
|                     | Cyl. 60 T.     | Cyl. 50 T. | Cyl. 40 T. | Cyl. 40 T. | Cyl. 36 T. | Cyl. 30 T. |
|                     | Jack 80 T.     | Jack 80 T. | Jack 80 T. | Jack 96 T. | Jack 96 T. | Jack 96 T. |
| 16                  | 11.11          | 13.33      | 16.67      | 20.00      | 22.22      | 26.67      |
| 17                  | 10.46          | 12.55      | 15.69      | 18.82      | 20.92      | 25.10      |
| 18                  | 9.88           | 11.85      | 14.82      | 17.78      | 19.75      | 23.70      |
| 19                  | 9.36           | 11.23      | 14.04      | 16.84      | 18.71      | 22.46      |
| 20                  | 8.89           | 10.67      | 13.33      | 16.00      | 17.78      | 21.33      |
| 21                  | 8.47           | 10.16      | 12.70      | 15.24      | 16.93      | 20.32      |
| 22                  | 8.08           | 9.70       | 12.12      | 14.55      | 16.16      | 19.39      |
| 23                  | 7.73           | 9.28       | 11.59      | 13.91      | 15.46      | 18.55      |
| 24                  | 7.41           | 8.89       | 11.11      | 13.33      | 14.82      | 17.78      |
| 25                  | 7.11           | 8.53       | 10.67      | 12.80      | 14.22      | 17.07      |
| 26                  | 6.84           | 8.20       | 10.26      | 12.31      | 13.68      | 16.41      |
| 27                  | 6.58           | 7.90       | 9.88       | 11.85      | 13.17      | 15.80      |
| 28                  | 6.35           | 7.62       | 9.52       | 11.43      | 12.70      | 15.24      |
| 29                  | 6.13           | 7.36       | 9.20       | 11.03      | 12.26      | 14.71      |
| 30                  | 5.93           | 7.11       | 8.89       | 10.67      | 11.85      | 14.22      |
| 31                  | 5.73           | 6.88       | 8.60       | 10.32      | 11.47      | 13.76      |
| 32                  | 5.56           | 6.67       | 8.33       | 10.00      | 11.11      | 13.33      |
| 33                  | 5.39           | 6.46       | 8.08       | 9.70       | 10.77      | 12.93      |
| 34                  | 5.23           | 6.27       | 7.84       | 9.41       | 10.46      | 12.55      |
| 35                  | 5.08           | 6.10       | 7.62       | 9.14       | 10.16      | 12.19      |
| 36                  | 4.94           | 5.93       | 7.41       | 8.89       | 9.88       | 11.86      |
| 37                  | 4.80           | 5.77       | 7.21       | 8.65       | 9.61       | 11.54      |
| 38                  | 4.68           | 5.61       | 7.02       | 8.42       | 9.36       | 11.22      |
| 39                  | 4.56           | 5.47       | 6.84       | 8.21       | 9.12       | 10.94      |
| 40                  | 4.44           | 5.33       | 6.67       | 8.00       | 8.89       | 10.67      |
| 41                  | 4.34           | 5.20       | 6.50       | 7.80       | 8.67       | 10.40      |
| 42                  | 4.23           | 5.08       | 6.35       | 7.62       | 8.47       | 10.16      |
| 43                  | 4.13           | 4.96       | 6.20       | 7.44       | 8.27       | 9.92       |
| 44                  | 4.04           | 4.85       | 6.06       | 7.27       | 8.08       | 9.70       |
| 45                  | 3.95           | 4.74       | 5.93       | 7.11       | 7.90       | 9.48       |
| 46                  | 3.86           | 4.64       | 5.80       | 6.96       | 7.73       | 9.28       |
| 47                  | 3.78           | 4.54       | 5.67       | 6.81       | 7.57       | 9.08       |
| 48                  | 3.70           | 4.44       | 5.56       | 6.67       | 7.41       | 8.89       |
| 49                  | 3.63           | 4.35       | 5.44       | 6.53       | 7.26       | 8.71       |
| 50                  | 3.56           | 4.27       | 5.33       | 6.40       | 7.11       | 8.53       |
| 51                  | 3.49           | 4.18       | 5.23       | 6.27       | 6.97       | 8.36       |
| 52                  | 3.42           | 4.10       | 5.13       | 6.15       | 6.84       | 8.20       |
| 53                  | 3.35           | 4.03       | 5.03       | 6.04       | 6.71       | 8.05       |
| 54                  | 3.29           | 3.95       | 4.94       | 5.93       | 6.58       | 7.90       |
| 55                  | 3.23           | 3.88       | 4.85       | 5.82       | 6.46       | 7.76       |
| 56                  | 3.17           | 3.81       | 4.76       | 5.71       | 6.35       | 7.62       |
| 57                  | 3.12           | 3.74       | 4.68       | 5.61       | 6.24       | 7.49       |
| 58                  | 3.07           | 3.68       | 4.60       | 5.52       | 6.13       | 7.36       |
| 59                  | 3.01           | 3.62       | 4.52       | 5.42       | 6.03       | 7.23       |
| 60                  | 2.96           | 3.56       | 4.44       | 5.33       | 5.93       | 7.11       |
| Constants           | 177.78         | 213.33     | 266.67     | 320.00     | 355.56     | 426.67     |

# TWIST GEARING TABLE—(Continued)

36" AND 39" TWISTERS

CYLINDER 7 INCHES DIAM. WHIRL  $1\frac{1}{8}$  INCHES DIAM.

RATIO OF CYLINDER TO WHIRL 1 TO 5.61

FRONT ROLL  $1\frac{1}{2}$  INCHES DIAM. FRONT ROLL GEAR 112 TEETH

| Change<br><br>Gears | TWIST PER INCH |             |             |             |             |             |
|---------------------|----------------|-------------|-------------|-------------|-------------|-------------|
|                     | Cyl. 30 T.     | Cyl. 27 T.  | Cyl. 24 T.  | Cyl. 24 T.  | Cyl. 21 T.  | Cyl. 18 T.  |
|                     | Jack 112 T.    | Jack 112 T. | Jack 112 T. | Jack 120 T. | Jack 120 T. | Jack 120 T. |
| 16                  | 31.11          | 34.57       | 38.89       | 41.67       | 47.62       | 55.56       |
| 17                  | 29.28          | 32.53       | 36.60       | 39.22       | 44.82       | 52.29       |
| 18                  | 27.65          | 30.73       | 34.57       | 37.04       | 42.33       | 49.38       |
| 19                  | 26.20          | 29.11       | 32.75       | 35.09       | 40.10       | 46.78       |
| 20                  | 24.89          | 27.65       | 31.11       | 33.33       | 38.10       | 44.44       |
| 21                  | 23.70          | 26.34       | 29.63       | 31.74       | 36.28       | 42.33       |
| 22                  | 22.63          | 25.14       | 28.28       | 30.30       | 34.63       | 40.40       |
| 23                  | 21.64          | 24.05       | 27.05       | 28.99       | 33.13       | 38.65       |
| 24                  | 20.74          | 23.05       | 25.93       | 27.78       | 31.75       | 37.04       |
| 25                  | 19.91          | 22.12       | 24.89       | 26.67       | 30.48       | 35.56       |
| 26                  | 19.14          | 21.27       | 23.93       | 25.64       | 29.30       | 34.19       |
| 27                  | 18.44          | 20.48       | 23.05       | 24.69       | 28.22       | 32.92       |
| 28                  | 17.78          | 19.75       | 22.22       | 23.81       | 27.21       | 31.75       |
| 29                  | 17.16          | 19.07       | 21.46       | 22.99       | 26.27       | 30.65       |
| 30                  | 16.59          | 18.44       | 20.74       | 22.22       | 25.40       | 29.63       |
| 31                  | 16.06          | 17.84       | 20.07       | 21.51       | 24.58       | 28.67       |
| 32                  | 15.56          | 17.28       | 19.44       | 20.83       | 23.81       | 27.78       |
| 33                  | 15.08          | 16.76       | 18.86       | 20.20       | 23.09       | 26.94       |
| 34                  | 14.64          | 16.27       | 18.30       | 19.61       | 22.41       | 26.14       |
| 35                  | 14.22          | 15.80       | 17.78       | 19.05       | 21.77       | 25.40       |
| 36                  | 13.83          | 15.36       | 17.28       | 18.52       | 21.16       | 24.69       |
| 37                  | 13.45          | 14.95       | 16.82       | 18.02       | 20.59       | 24.02       |
| 38                  | 13.10          | 14.55       | 16.37       | 17.54       | 20.05       | 23.39       |
| 39                  | 12.76          | 14.18       | 15.95       | 17.09       | 19.54       | 22.79       |
| 40                  | 12.44          | 13.83       | 15.56       | 16.67       | 19.05       | 22.22       |
| 41                  | 12.14          | 13.49       | 15.18       | 16.26       | 18.58       | 21.68       |
| 42                  | 11.85          | 13.17       | 14.82       | 15.87       | 18.14       | 21.16       |
| 43                  | 11.58          | 12.86       | 14.47       | 15.50       | 17.72       | 20.67       |
| 44                  | 11.31          | 12.57       | 14.14       | 15.15       | 17.32       | 20.20       |
| 45                  | 11.06          | 12.29       | 13.83       | 14.81       | 16.93       | 19.75       |
| 46                  | 10.82          | 12.02       | 13.53       | 14.49       | 16.56       | 19.32       |
| 47                  | 10.59          | 11.77       | 13.24       | 14.18       | 16.21       | 18.91       |
| 48                  | 10.37          | 11.52       | 12.96       | 13.89       | 15.87       | 18.52       |
| 49                  | 10.16          | 11.29       | 12.70       | 13.61       | 15.55       | 18.14       |
| 50                  | 9.96           | 11.06       | 12.44       | 13.33       | 14.24       | 17.78       |
| 51                  | 9.76           | 10.84       | 12.20       | 13.07       | 14.94       | 17.43       |
| 52                  | 9.57           | 10.64       | 11.97       | 12.82       | 14.65       | 17.09       |
| 53                  | 9.39           | 10.44       | 11.74       | 12.57       | 14.38       | 16.77       |
| 54                  | 9.22           | 10.24       | 11.52       | 12.35       | 14.11       | 16.46       |
| 55                  | 9.05           | 10.06       | 11.31       | 12.12       | 13.85       | 16.16       |
| 56                  | 8.89           | 9.88        | 11.11       | 11.90       | 13.61       | 15.87       |
| 57                  | 8.73           | 9.70        | 10.92       | 11.70       | 13.37       | 15.59       |
| 58                  | 8.58           | 9.54        | 10.73       | 11.49       | 13.14       | 15.33       |
| 59                  | 8.44           | 9.37        | 10.55       | 11.30       | 12.91       | 15.07       |
| 60                  | 8.30           | 9.22        | 10.37       | 11.11       | 12.70       | 14.81       |
| Constants           | 497.78         | 553.09      | 622.22      | 666.67      | 761.90      | 888.89      |

# TWIST GEARING TABLE

36" AND 39" TWISTERS

**CYLINDER 7 INCHES DIAM. WHIRL 1½ INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 5.12

FRONT ROLL 1½ INCHES DIAM. FRONT ROLL GEAR 112 TEETH

| Change<br><br>Gears | TWIST PER INCH |            |            |            |            |            |
|---------------------|----------------|------------|------------|------------|------------|------------|
|                     | Cyl. 60 T.     | Cyl. 50 T. | Cyl. 40 T. | Cyl. 40 T. | Cyl. 36 T. | Cyl. 30 T. |
|                     | Jack 80 T.     | Jack 80 T. | Jack 80 T. | Jack 96 T. | Jack 96 T. | Jack 96 T. |
| 16                  | 10.14          | 12.17      | 15.21      | 18.25      | 20.28      | 24.34      |
| 17                  | 9.54           | 11.45      | 14.32      | 17.18      | 19.09      | 22.91      |
| 18                  | 9.01           | 10.82      | 13.52      | 16.23      | 18.03      | 21.63      |
| 19                  | 8.54           | 10.25      | 12.81      | 15.37      | 17.08      | 20.49      |
| 20                  | 8.11           | 9.74       | 12.17      | 14.60      | 16.23      | 19.47      |
| 21                  | 7.73           | 9.27       | 11.59      | 13.91      | 15.45      | 18.54      |
| 22                  | 7.38           | 8.85       | 11.06      | 13.28      | 14.75      | 17.70      |
| 23                  | 7.05           | 8.47       | 10.58      | 12.70      | 14.11      | 16.93      |
| 24                  | 6.76           | 8.11       | 10.14      | 12.17      | 13.52      | 16.23      |
| 25                  | 6.49           | 7.79       | 9.73       | 11.68      | 12.98      | 15.58      |
| 26                  | 6.24           | 7.49       | 9.36       | 11.23      | 12.48      | 14.98      |
| 27                  | 6.01           | 7.21       | 9.01       | 10.82      | 12.02      | 14.42      |
| 28                  | 5.79           | 6.95       | 8.69       | 10.43      | 11.59      | 13.91      |
| 29                  | 5.59           | 6.71       | 8.39       | 10.07      | 11.19      | 13.43      |
| 30                  | 5.41           | 6.49       | 8.11       | 9.74       | 10.82      | 12.98      |
| 31                  | 5.23           | 6.28       | 7.85       | 9.42       | 10.47      | 12.56      |
| 32                  | 5.07           | 6.09       | 7.61       | 9.13       | 10.14      | 12.18      |
| 33                  | 4.92           | 5.90       | 7.37       | 8.85       | 9.83       | 11.80      |
| 34                  | 4.77           | 5.73       | 7.16       | 8.59       | 9.54       | 11.45      |
| 35                  | 4.64           | 5.56       | 6.95       | 8.34       | 9.27       | 11.13      |
| 36                  | 4.51           | 5.41       | 6.76       | 8.11       | 9.01       | 10.82      |
| 37                  | 4.39           | 5.26       | 6.58       | 7.89       | 8.77       | 10.52      |
| 38                  | 4.27           | 5.12       | 6.40       | 7.69       | 8.54       | 10.24      |
| 39                  | 4.16           | 4.99       | 6.24       | 7.49       | 8.32       | 9.98       |
| 40                  | 4.06           | 4.87       | 6.08       | 7.30       | 8.11       | 9.74       |
| 41                  | 3.96           | 4.75       | 5.94       | 7.12       | 7.91       | 9.50       |
| 42                  | 3.86           | 4.64       | 5.79       | 7.00       | 7.73       | 9.28       |
| 43                  | 3.77           | 4.53       | 5.66       | 6.79       | 7.55       | 9.06       |
| 44                  | 3.69           | 4.43       | 5.53       | 6.64       | 7.38       | 8.85       |
| 45                  | 3.61           | 4.33       | 5.41       | 6.49       | 7.21       | 8.65       |
| 46                  | 3.53           | 4.23       | 5.29       | 6.35       | 7.05       | 8.46       |
| 47                  | 3.45           | 4.14       | 5.18       | 6.21       | 6.90       | 8.28       |
| 48                  | 3.38           | 4.05       | 5.07       | 6.08       | 6.76       | 8.11       |
| 49                  | 3.31           | 3.97       | 4.97       | 6.96       | 6.62       | 7.95       |
| 50                  | 3.25           | 3.89       | 4.87       | 5.84       | 6.49       | 7.78       |
| 51                  | 3.18           | 3.82       | 4.77       | 5.73       | 6.36       | 7.64       |
| 52                  | 3.12           | 3.74       | 4.68       | 5.62       | 6.24       | 7.49       |
| 53                  | 3.06           | 3.67       | 4.59       | 5.51       | 6.12       | 7.35       |
| 54                  | 3.00           | 3.61       | 4.51       | 5.41       | 6.01       | 7.21       |
| 55                  | 2.95           | 3.54       | 4.42       | 5.31       | 5.90       | 7.08       |
| 56                  | 2.90           | 3.48       | 4.35       | 5.22       | 5.79       | 6.96       |
| 57                  | 2.85           | 3.42       | 4.27       | 5.12       | 5.69       | 6.84       |
| 58                  | 2.80           | 3.36       | 4.20       | 5.04       | 5.59       | 6.72       |
| 59                  | 2.75           | 3.30       | 4.12       | 4.95       | 5.50       | 6.60       |
| 60                  | 2.70           | 3.25       | 4.06       | 4.87       | 5.41       | 6.49       |
| Constants           | 162.25         | 194.70     | 243.37     | 292.05     | 324.50     | 389.40     |



# TWIST GEARING TABLE—(Continued)

36" AND 39" TWISTERS

CYLINDER 7 INCHES DIAM. WHIRL 1½ INCHES DIAM.

RATIO OF CYLINDER TO WHIRL 1 TO 5.12

FRONT ROLL 1½ INCHES DIAM. FRONT ROLL GEAR 112 TEETH

| Change<br>Gears | TWIST PER INCH            |                           |                           |                           |                           |                           |
|-----------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
|                 | Cyl. 30 T.<br>Jack 112 T. | Cyl. 27 T.<br>Jack 112 T. | Cyl. 24 T.<br>Jack 112 T. | Cyl. 24 T.<br>Jack 120 T. | Cyl. 21 T.<br>Jack 120 T. | Cyl. 18 T.<br>Jack 120 T. |
| 16              | 28.39                     | 31.55                     | 35.49                     | 38.03                     | 43.46                     | 50.70                     |
| 17              | 26.72                     | 29.69                     | 33.40                     | 35.79                     | 40.90                     | 47.72                     |
| 18              | 25.24                     | 28.04                     | 31.55                     | 33.80                     | 38.63                     | 45.07                     |
| 19              | 23.91                     | 26.57                     | 29.89                     | 32.02                     | 36.60                     | 42.70                     |
| 20              | 22.72                     | 25.24                     | 28.39                     | 30.42                     | 34.77                     | 40.56                     |
| 21              | 21.63                     | 24.03                     | 27.04                     | 28.97                     | 33.11                     | 38.63                     |
| 22              | 20.65                     | 22.94                     | 25.81                     | 27.65                     | 31.61                     | 36.88                     |
| 23              | 19.75                     | 21.95                     | 24.69                     | 26.45                     | 30.23                     | 35.27                     |
| 24              | 18.93                     | 21.03                     | 23.66                     | 25.35                     | 28.97                     | 33.80                     |
| 25              | 18.17                     | 20.19                     | 22.71                     | 24.34                     | 27.81                     | 32.45                     |
| 26              | 17.47                     | 19.41                     | 21.84                     | 23.40                     | 26.74                     | 31.20                     |
| 27              | 16.83                     | 18.70                     | 21.03                     | 22.53                     | 25.75                     | 30.05                     |
| 28              | 16.23                     | 18.03                     | 20.28                     | 21.73                     | 24.83                     | 28.97                     |
| 29              | 15.67                     | 17.41                     | 19.58                     | 20.98                     | 23.98                     | 27.97                     |
| 30              | 15.14                     | 16.83                     | 18.93                     | 20.28                     | 23.18                     | 27.04                     |
| 31              | 14.65                     | 16.28                     | 18.32                     | 19.63                     | 22.43                     | 26.17                     |
| 32              | 14.20                     | 15.77                     | 17.75                     | 19.01                     | 21.73                     | 25.35                     |
| 33              | 13.77                     | 15.30                     | 17.21                     | 18.44                     | 21.07                     | 24.58                     |
| 34              | 13.36                     | 14.85                     | 16.70                     | 17.90                     | 20.45                     | 23.86                     |
| 35              | 12.98                     | 14.42                     | 16.22                     | 17.38                     | 19.87                     | 23.18                     |
| 36              | 12.62                     | 14.02                     | 15.77                     | 16.90                     | 19.32                     | 22.53                     |
| 37              | 12.28                     | 13.64                     | 15.35                     | 16.44                     | 18.79                     | 21.93                     |
| 38              | 11.96                     | 13.28                     | 14.94                     | 16.01                     | 18.30                     | 21.35                     |
| 39              | 11.65                     | 12.94                     | 14.56                     | 15.60                     | 17.83                     | 20.80                     |
| 40              | 11.36                     | 12.62                     | 14.20                     | 15.21                     | 17.38                     | 20.28                     |
| 41              | 11.08                     | 12.31                     | 13.85                     | 14.84                     | 16.96                     | 19.79                     |
| 42              | 10.82                     | 12.02                     | 13.52                     | 14.49                     | 16.56                     | 19.32                     |
| 43              | 10.56                     | 11.74                     | 13.21                     | 14.15                     | 16.17                     | 18.87                     |
| 44              | 10.33                     | 11.47                     | 12.91                     | 13.83                     | 15.80                     | 18.44                     |
| 45              | 10.10                     | 11.22                     | 12.62                     | 13.52                     | 15.45                     | 18.03                     |
| 46              | 9.87                      | 10.97                     | 12.35                     | 13.23                     | 15.12                     | 17.64                     |
| 47              | 9.67                      | 10.74                     | 12.08                     | 12.95                     | 14.79                     | 17.26                     |
| 48              | 9.46                      | 10.52                     | 11.83                     | 12.68                     | 14.49                     | 16.90                     |
| 49              | 9.27                      | 10.30                     | 11.59                     | 12.42                     | 14.19                     | 16.56                     |
| 50              | 9.09                      | 10.10                     | 11.36                     | 12.17                     | 13.91                     | 16.23                     |
| 51              | 8.91                      | 9.90                      | 11.13                     | 11.93                     | 13.63                     | 15.91                     |
| 52              | 8.74                      | 9.71                      | 10.92                     | 11.70                     | 13.37                     | 15.60                     |
| 53              | 8.57                      | 9.52                      | 10.71                     | 11.48                     | 13.12                     | 15.31                     |
| 54              | 8.41                      | 9.35                      | 10.52                     | 11.27                     | 12.88                     | 15.02                     |
| 55              | 8.26                      | 9.18                      | 10.32                     | 11.06                     | 12.64                     | 14.75                     |
| 56              | 8.12                      | 9.01                      | 10.14                     | 10.87                     | 12.42                     | 14.49                     |
| 57              | 7.97                      | 8.86                      | 9.96                      | 10.67                     | 12.20                     | 14.23                     |
| 58              | 7.83                      | 8.70                      | 9.79                      | 10.49                     | 11.99                     | 13.99                     |
| 59              | 7.70                      | 8.56                      | 9.62                      | 10.31                     | 11.79                     | 13.75                     |
| 60              | 7.57                      | 8.41                      | 9.46                      | 10.14                     | 11.59                     | 13.52                     |
| Constants       | 454.30                    | 504.78                    | 567.87                    | 608.44                    | 695.36                    | 811.25                    |

# TWIST GEARING TABLE

36" AND 39" TWISTERS

**CYLINDER 7 INCHES DIAM. WHIRL  $1\frac{3}{8}$  INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 4.70

FRONT ROLL  $1\frac{1}{2}$  INCHES DIAM. FRONT ROLL GEAR 112 TEETH

| Change<br><br>Gears | TWIST PER INCH |            |            |            |            |            |
|---------------------|----------------|------------|------------|------------|------------|------------|
|                     | Cyl. 60 T.     | Cyl. 50 T. | Cyl. 40 T. | Cyl. 40 T. | Cyl. 36 T. | Cyl. 30 T. |
|                     | Jack 80 T.     | Jack 80 T. | Jack 80 T. | Jack 96 T. | Jack 96 T. | Jack 96 T. |
| 16                  | 9.31           | 11.17      | 13.96      | 16.76      | 18.62      | 22.34      |
| 17                  | 8.76           | 10.51      | 13.14      | 15.77      | 17.52      | 21.03      |
| 18                  | 8.27           | 9.93       | 12.41      | 14.89      | 16.55      | 19.86      |
| 19                  | 7.84           | 9.41       | 11.76      | 14.11      | 15.68      | 18.81      |
| 20                  | 7.45           | 8.94       | 11.17      | 13.40      | 14.89      | 17.87      |
| 21                  | 7.09           | 8.51       | 10.64      | 12.77      | 14.18      | 17.02      |
| 22                  | 6.77           | 8.12       | 10.16      | 12.19      | 13.54      | 16.25      |
| 23                  | 6.48           | 7.77       | 9.71       | 11.66      | 12.95      | 15.54      |
| 24                  | 6.21           | 7.45       | 9.31       | 11.17      | 12.41      | 14.89      |
| 25                  | 5.96           | 7.15       | 8.94       | 10.72      | 11.92      | 14.30      |
| 26                  | 5.73           | 6.87       | 8.59       | 10.31      | 11.46      | 13.75      |
| 27                  | 5.52           | 6.62       | 8.27       | 9.93       | 11.03      | 13.24      |
| 28                  | 5.32           | 6.38       | 7.98       | 9.57       | 10.64      | 12.77      |
| 29                  | 5.14           | 6.16       | 7.70       | 9.24       | 10.27      | 12.33      |
| 30                  | 4.96           | 5.96       | 7.45       | 8.94       | 9.93       | 11.92      |
| 31                  | 4.80           | 5.77       | 7.21       | 8.65       | 9.61       | 11.53      |
| 32                  | 4.65           | 5.59       | 6.98       | 8.38       | 9.31       | 11.17      |
| 33                  | 4.51           | 5.42       | 6.77       | 8.12       | 9.03       | 10.83      |
| 34                  | 4.38           | 5.26       | 6.57       | 7.89       | 8.76       | 10.51      |
| 35                  | 4.26           | 5.11       | 6.38       | 7.66       | 8.51       | 10.21      |
| 36                  | 4.14           | 4.96       | 6.21       | 7.45       | 8.27       | 9.93       |
| 37                  | 4.03           | 4.83       | 6.04       | 7.25       | 8.05       | 9.66       |
| 38                  | 3.92           | 4.70       | 5.88       | 7.06       | 7.84       | 9.41       |
| 39                  | 3.82           | 4.58       | 5.73       | 6.87       | 7.64       | 9.17       |
| 40                  | 3.72           | 4.47       | 5.59       | 6.70       | 7.45       | 8.94       |
| 41                  | 3.63           | 4.36       | 5.45       | 6.54       | 7.27       | 8.72       |
| 42                  | 3.55           | 4.26       | 5.32       | 6.38       | 7.09       | 8.51       |
| 43                  | 3.46           | 4.16       | 5.20       | 6.23       | 6.93       | 8.31       |
| 44                  | 3.39           | 4.06       | 5.08       | 6.09       | 6.77       | 8.12       |
| 45                  | 3.31           | 3.97       | 4.96       | 5.96       | 6.62       | 7.94       |
| 46                  | 3.24           | 3.88       | 4.86       | 5.83       | 6.48       | 7.77       |
| 47                  | 3.17           | 3.80       | 4.75       | 5.70       | 6.34       | 7.61       |
| 48                  | 3.10           | 3.72       | 4.65       | 5.59       | 6.21       | 7.45       |
| 49                  | 3.04           | 3.65       | 4.56       | 5.47       | 6.08       | 7.30       |
| 50                  | 2.98           | 3.57       | 4.47       | 5.36       | 5.96       | 7.15       |
| 51                  | 2.92           | 3.50       | 4.38       | 5.26       | 5.84       | 7.01       |
| 52                  | 2.86           | 3.44       | 4.30       | 5.16       | 5.73       | 6.87       |
| 53                  | 2.81           | 3.37       | 4.22       | 5.06       | 5.62       | 6.74       |
| 54                  | 2.76           | 3.31       | 4.14       | 4.96       | 5.52       | 6.62       |
| 55                  | 2.71           | 3.25       | 4.06       | 4.87       | 5.42       | 6.50       |
| 56                  | 2.66           | 3.19       | 3.99       | 4.79       | 5.32       | 6.38       |
| 57                  | 2.61           | 3.14       | 3.92       | 4.70       | 5.23       | 6.27       |
| 58                  | 2.57           | 3.08       | 3.85       | 4.62       | 5.14       | 6.16       |
| 59                  | 2.52           | 3.03       | 3.79       | 4.54       | 5.05       | 6.06       |
| 60                  | 2.48           | 2.98       | 3.72       | 4.47       | 4.96       | 5.96       |
| Constants           | 148.94         | 178.73     | 223.41     | 268.09     | 297.88     | 357.46     |

# TWIST GEARING TABLE —(Continued)

36" AND 39" TWISTERS

**CYLINDER 7 INCHES DIAM. WHIRL  $1\frac{3}{8}$  INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 4.70

**FRONT ROLL  $1\frac{1}{2}$  INCHES DIAM. FRONT ROLL GEAR 112 TEETH**

| Change<br>Gears | TWIST PER INCH            |                           |                           |                           |                           |                           |
|-----------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
|                 | Cyl. 30 T.<br>Jack 112 T. | Cyl. 27 T.<br>Jack 112 T. | Cyl. 24 T.<br>Jack 112 T. | Cyl. 24 T.<br>Jack 120 T. | Cyl. 21 T.<br>Jack 120 T. | Cyl. 18 T.<br>Jack 120 T. |
| 16              | 26.06                     | 28.96                     | 32.58                     | 34.91                     | 39.90                     | 46.54                     |
| 17              | 24.53                     | 27.26                     | 30.66                     | 32.85                     | 37.55                     | 43.81                     |
| 18              | 23.17                     | 25.74                     | 28.96                     | 31.03                     | 35.46                     | 41.37                     |
| 19              | 21.95                     | 24.39                     | 27.44                     | 29.40                     | 33.60                     | 39.19                     |
| 20              | 20.85                     | 23.17                     | 26.06                     | 27.93                     | 31.92                     | 37.24                     |
| 21              | 19.86                     | 22.07                     | 24.82                     | 26.60                     | 30.40                     | 35.46                     |
| 22              | 18.96                     | 21.06                     | 23.70                     | 25.39                     | 29.01                     | 33.85                     |
| 23              | 18.13                     | 20.15                     | 22.66                     | 24.28                     | 27.75                     | 32.38                     |
| 24              | 17.38                     | 19.31                     | 21.72                     | 23.27                     | 26.60                     | 31.03                     |
| 25              | 16.68                     | 18.53                     | 20.85                     | 22.34                     | 25.53                     | 29.79                     |
| 26              | 16.04                     | 17.82                     | 20.05                     | 21.48                     | 24.55                     | 28.64                     |
| 27              | 15.45                     | 17.16                     | 19.31                     | 20.69                     | 23.64                     | 27.58                     |
| 28              | 14.89                     | 16.55                     | 18.62                     | 19.95                     | 22.80                     | 26.60                     |
| 29              | 14.38                     | 15.98                     | 17.98                     | 19.26                     | 22.01                     | 25.68                     |
| 30              | 13.90                     | 15.45                     | 17.38                     | 18.62                     | 21.28                     | 24.82                     |
| 31              | 13.45                     | 14.95                     | 16.82                     | 18.02                     | 20.59                     | 24.02                     |
| 32              | 13.03                     | 14.48                     | 16.29                     | 17.45                     | 19.95                     | 23.27                     |
| 33              | 12.64                     | 14.04                     | 15.80                     | 16.92                     | 19.34                     | 22.57                     |
| 34              | 12.27                     | 13.63                     | 15.33                     | 16.43                     | 18.77                     | 21.90                     |
| 35              | 11.92                     | 13.24                     | 14.89                     | 15.96                     | 18.24                     | 21.28                     |
| 36              | 11.58                     | 12.87                     | 14.48                     | 15.51                     | 17.73                     | 20.69                     |
| 37              | 11.27                     | 12.52                     | 14.09                     | 15.10                     | 17.25                     | 20.13                     |
| 38              | 10.97                     | 12.19                     | 13.72                     | 14.70                     | 16.80                     | 19.60                     |
| 39              | 10.69                     | 11.88                     | 13.37                     | 14.32                     | 16.37                     | 19.09                     |
| 40              | 10.43                     | 11.58                     | 13.03                     | 13.96                     | 15.96                     | 18.62                     |
| 41              | 10.17                     | 11.30                     | 12.71                     | 13.62                     | 15.57                     | 18.16                     |
| 42              | 9.93                      | 11.03                     | 12.41                     | 13.30                     | 15.20                     | 17.73                     |
| 43              | 9.70                      | 10.78                     | 12.12                     | 12.99                     | 14.84                     | 17.32                     |
| 44              | 9.48                      | 10.53                     | 11.85                     | 12.69                     | 14.51                     | 16.93                     |
| 45              | 9.27                      | 10.30                     | 11.58                     | 12.41                     | 14.18                     | 16.55                     |
| 46              | 9.07                      | 10.07                     | 11.33                     | 12.14                     | 13.88                     | 16.19                     |
| 47              | 8.87                      | 9.86                      | 11.09                     | 11.88                     | 13.58                     | 15.84                     |
| 48              | 8.69                      | 9.65                      | 10.86                     | 11.64                     | 13.30                     | 15.51                     |
| 49              | 8.51                      | 9.46                      | 10.64                     | 11.40                     | 13.03                     | 15.20                     |
| 50              | 8.34                      | 9.27                      | 10.43                     | 11.17                     | 12.77                     | 14.89                     |
| 51              | 8.18                      | 9.09                      | 10.22                     | 10.95                     | 12.52                     | 14.60                     |
| 52              | 8.02                      | 8.91                      | 10.02                     | 10.74                     | 12.28                     | 14.32                     |
| 53              | 7.87                      | 8.74                      | 9.84                      | 10.54                     | 12.04                     | 14.05                     |
| 54              | 7.72                      | 8.58                      | 9.65                      | 10.34                     | 11.82                     | 13.79                     |
| 55              | 7.58                      | 8.42                      | 9.48                      | 10.16                     | 11.61                     | 13.54                     |
| 56              | 7.45                      | 8.27                      | 9.31                      | 9.97                      | 11.40                     | 13.30                     |
| 57              | 7.32                      | 8.13                      | 9.15                      | 9.80                      | 11.20                     | 13.06                     |
| 58              | 7.19                      | 7.99                      | 8.99                      | 9.63                      | 10.01                     | 12.84                     |
| 59              | 7.07                      | 7.85                      | 8.84                      | 9.47                      | 10.82                     | 12.62                     |
| 60              | 6.95                      | 7.72                      | 8.69                      | 9.31                      | 10.64                     | 12.41                     |
| Constants       | 417.03                    | 463.37                    | 521.29                    | 558.53                    | 638.32                    | 744.70                    |

# TWIST GEARING TABLE

36" AND 39" TWISTERS

**CYLINDER 7 INCHES DIAM. WHIRL  $1\frac{1}{2}$  INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 4.35

**FRONT ROLL  $1\frac{1}{2}$  INCHES DIAM. FRONT ROLL GEAR 112 TEETH**

| Change<br>Gears | TWIST PER INCH |            |            |            |            |            |
|-----------------|----------------|------------|------------|------------|------------|------------|
|                 | Cyl. 60 T.     | Cyl. 50 T. | Cyl. 40 T. | Cyl. 40 T. | Cyl. 36 T. | Cyl. 30 T. |
|                 | Jack 80 T.     | Jack 80 T. | Jack 80 T. | Jack 96 T. | Jack 96 T. | Jack 96 T. |
| 16              | 8.62           | 10.34      | 12.92      | 15.51      | 17.23      | 20.68      |
| 17              | 8.11           | 9.73       | 12.16      | 14.60      | 16.22      | 19.46      |
| 18              | 7.66           | 9.19       | 11.49      | 13.79      | 15.32      | 18.38      |
| 19              | 7.26           | 8.71       | 10.88      | 13.06      | 14.51      | 17.41      |
| 20              | 6.89           | 8.27       | 10.34      | 12.41      | 13.79      | 16.54      |
| 21              | 6.56           | 7.88       | 9.85       | 11.82      | 13.13      | 15.75      |
| 22              | 6.27           | 7.52       | 9.40       | 11.28      | 12.53      | 15.04      |
| 23              | 5.99           | 7.19       | 8.99       | 10.79      | 11.99      | 14.38      |
| 24              | 5.74           | 6.89       | 8.62       | 10.34      | 11.49      | 13.79      |
| 25              | 5.51           | 6.62       | 8.27       | 9.93       | 11.03      | 13.23      |
| 26              | 5.30           | 6.36       | 7.95       | 9.54       | 10.60      | 12.72      |
| 27              | 5.11           | 6.13       | 7.66       | 9.19       | 10.21      | 12.25      |
| 28              | 4.92           | 5.91       | 7.38       | 8.86       | 9.85       | 11.82      |
| 29              | 4.75           | 5.70       | 7.13       | 8.56       | 9.51       | 11.41      |
| 30              | 4.60           | 5.51       | 6.89       | 8.27       | 9.19       | 11.03      |
| 31              | 4.45           | 5.34       | 6.67       | 8.00       | 8.89       | 10.67      |
| 32              | 4.31           | 5.17       | 6.46       | 7.75       | 8.62       | 10.34      |
| 33              | 4.18           | 5.01       | 6.27       | 7.52       | 8.35       | 10.03      |
| 34              | 4.05           | 4.87       | 6.08       | 7.30       | 8.11       | 9.73       |
| 35              | 3.94           | 4.73       | 5.91       | 7.09       | 7.88       | 9.45       |
| 36              | 3.83           | 4.60       | 5.74       | 6.89       | 7.66       | 9.19       |
| 37              | 3.73           | 4.47       | 5.59       | 6.71       | 7.45       | 8.94       |
| 38              | 3.63           | 4.35       | 5.44       | 6.53       | 7.26       | 8.71       |
| 39              | 3.53           | 4.24       | 5.30       | 6.36       | 7.07       | 8.48       |
| 40              | 3.45           | 4.14       | 5.17       | 6.20       | 6.89       | 8.27       |
| 41              | 3.36           | 4.03       | 5.04       | 6.05       | 6.72       | 8.07       |
| 42              | 3.28           | 3.94       | 4.92       | 5.91       | 6.56       | 7.88       |
| 43              | 3.21           | 3.85       | 4.81       | 5.77       | 6.41       | 7.69       |
| 44              | 3.13           | 3.76       | 4.70       | 5.64       | 6.27       | 7.52       |
| 45              | 3.06           | 3.67       | 4.59       | 5.51       | 6.13       | 7.35       |
| 46              | 3.00           | 3.60       | 4.50       | 5.39       | 5.99       | 7.19       |
| 47              | 2.93           | 3.52       | 4.40       | 5.28       | 5.87       | 7.04       |
| 48              | 2.87           | 3.45       | 4.31       | 5.17       | 5.74       | 6.89       |
| 49              | 2.81           | 3.38       | 4.22       | 5.06       | 5.63       | 6.75       |
| 50              | 2.76           | 3.31       | 4.14       | 4.96       | 5.51       | 6.62       |
| 51              | 2.70           | 3.24       | 4.05       | 4.87       | 5.41       | 6.49       |
| 52              | 2.65           | 3.18       | 3.97       | 4.77       | 5.30       | 6.36       |
| 53              | 2.60           | 3.12       | 3.90       | 4.68       | 5.20       | 6.24       |
| 54              | 2.55           | 3.06       | 3.83       | 4.60       | 5.11       | 6.13       |
| 55              | 2.51           | 3.01       | 3.76       | 4.51       | 5.01       | 6.02       |
| 56              | 2.46           | 2.95       | 3.69       | 4.43       | 4.92       | 5.91       |
| 57              | 2.42           | 2.90       | 3.63       | 4.35       | 4.84       | 5.80       |
| 58              | 2.38           | 2.85       | 3.57       | 4.28       | 4.75       | 5.70       |
| 59              | 2.34           | 2.80       | 3.50       | 4.21       | 4.67       | 5.61       |
| 60              | 2.30           | 2.76       | 3.45       | 4.14       | 4.60       | 5.51       |
| Constants       | 137.85         | 165.41     | 206.77     | 248.13     | 275.70     | 330.84     |

# TWIST GEARING TABLE —(Continued)

36" AND 39" TWISTERS

**CYLINDER 7 INCHES DIAM. WHIRL 1½ INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 4.35

**FRONT ROLL 1½ INCHES DIAM. FRONT ROLL GEAR 112 TEETH**

| Change<br>Gears | TWIST PER INCH |             |             |             |             |             |
|-----------------|----------------|-------------|-------------|-------------|-------------|-------------|
|                 | Cyl. 30 T.     | Cyl. 27 T.  | Cyl. 24 T.  | Cyl. 24 T.  | Cyl. 21 T.  | Cyl. 18 T.  |
|                 | Jack 112 T.    | Jack 112 T. | Jack 112 T. | Jack 120 T. | Jack 120 T. | Jack 120 T. |
| 16              | 24.12          | 26.80       | 30.15       | 32.31       | 36.92       | 43.08       |
| 17              | 22.70          | 25.23       | 28.38       | 30.41       | 34.75       | 40.54       |
| 18              | 21.44          | 23.83       | 26.80       | 28.72       | 32.82       | 38.29       |
| 19              | 20.31          | 22.57       | 25.39       | 27.21       | 31.09       | 36.28       |
| 20              | 19.30          | 21.44       | 24.12       | 25.85       | 29.54       | 34.46       |
| 21              | 18.38          | 20.42       | 22.97       | 24.62       | 28.13       | 32.82       |
| 22              | 17.54          | 19.49       | 21.93       | 23.50       | 26.85       | 31.33       |
| 23              | 16.78          | 18.65       | 20.98       | 22.48       | 25.69       | 29.97       |
| 24              | 16.08          | 17.87       | 20.10       | 21.54       | 24.62       | 28.72       |
| 25              | 15.44          | 17.15       | 19.30       | 20.68       | 23.63       | 27.57       |
| 26              | 14.85          | 16.49       | 18.56       | 19.88       | 22.72       | 26.51       |
| 27              | 14.30          | 15.88       | 17.87       | 19.15       | 21.88       | 25.53       |
| 28              | 13.79          | 15.32       | 17.23       | 18.46       | 21.10       | 24.62       |
| 29              | 13.31          | 14.79       | 16.64       | 17.83       | 20.37       | 23.77       |
| 30              | 12.87          | 14.30       | 16.08       | 17.23       | 19.69       | 22.98       |
| 31              | 12.45          | 13.83       | 15.56       | 16.68       | 19.06       | 22.23       |
| 32              | 12.06          | 13.40       | 15.08       | 16.15       | 18.46       | 21.54       |
| 33              | 11.70          | 13.00       | 14.62       | 15.66       | 17.90       | 20.89       |
| 34              | 11.35          | 12.61       | 14.19       | 15.20       | 17.38       | 20.27       |
| 35              | 11.03          | 12.25       | 13.78       | 14.77       | 16.88       | 19.69       |
| 36              | 10.72          | 11.91       | 13.40       | 14.36       | 16.41       | 19.15       |
| 37              | 10.43          | 11.59       | 13.04       | 13.97       | 15.97       | 18.63       |
| 38              | 10.16          | 11.29       | 12.70       | 13.60       | 15.55       | 18.14       |
| 39              | 9.90           | 11.00       | 12.37       | 13.25       | 15.15       | 17.67       |
| 40              | 9.65           | 10.72       | 12.06       | 12.92       | 14.77       | 17.23       |
| 41              | 9.41           | 10.46       | 11.77       | 12.61       | 14.41       | 16.81       |
| 42              | 9.19           | 10.21       | 11.49       | 12.31       | 14.07       | 16.41       |
| 43              | 8.98           | 9.97        | 11.22       | 12.02       | 13.74       | 16.03       |
| 44              | 8.77           | 9.75        | 10.97       | 11.75       | 13.43       | 15.66       |
| 45              | 8.58           | 9.53        | 10.72       | 11.49       | 13.13       | 15.32       |
| 46              | 8.39           | 9.32        | 10.49       | 11.24       | 12.84       | 14.98       |
| 47              | 8.21           | 9.12        | 10.27       | 11.00       | 12.57       | 14.66       |
| 48              | 8.04           | 8.93        | 10.05       | 10.77       | 12.31       | 14.36       |
| 49              | 7.88           | 8.75        | 9.85        | 10.55       | 12.06       | 14.07       |
| 50              | 7.72           | 8.58        | 9.65        | 10.34       | 11.82       | 13.79       |
| 51              | 7.57           | 8.41        | 9.46        | 10.14       | 11.58       | 13.51       |
| 52              | 7.42           | 8.25        | 9.28        | 9.94        | 11.36       | 13.25       |
| 53              | 7.28           | 8.09        | 9.10        | 9.75        | 11.15       | 13.00       |
| 54              | 7.15           | 7.94        | 8.93        | 9.57        | 10.94       | 12.76       |
| 55              | 7.02           | 7.80        | 8.77        | 9.40        | 10.74       | 12.53       |
| 56              | 6.89           | 7.66        | 8.62        | 9.23        | 10.55       | 12.31       |
| 57              | 6.77           | 7.52        | 8.46        | 9.07        | 10.36       | 12.09       |
| 58              | 6.65           | 7.39        | 8.32        | 8.91        | 10.19       | 11.88       |
| 59              | 6.54           | 7.27        | 8.18        | 8.76        | 10.01       | 11.68       |
| 60              | 6.43           | 7.15        | 8.04        | 8.62        | 9.85        | 11.49       |
| Constants       | 385.98         | 428.86      | 482.47      | 516.93      | 590.78      | 689.25      |

# TWIST GEARING TABLE

36" AND 39" TWISTERS

**CYLINDER 7 INCHES DIAM. WHIRL  $1\frac{5}{8}$  INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 4.04

FRONT ROLL  $1\frac{1}{2}$  INCHES DIAM. FRONT ROLL GEAR 112 TEETH

| Change<br><br>Gears | TWIST PER INCH |            |            |            |            |            |
|---------------------|----------------|------------|------------|------------|------------|------------|
|                     | Cyl. 60 T.     | Cyl. 50 T. | Cyl. 40 T. | Cyl. 40 T. | Cyl. 36 T. | Cyl. 30 T. |
|                     | Jack 80 T.     | Jack 80 T. | Jack 80 T. | Jack 96 T. | Jack 96 T. | Jack 96 T. |
| 16                  | 8.00           | 9.60       | 12.00      | 14.40      | 16.00      | 19.20      |
| 17                  | 7.53           | 9.04       | 11.30      | 13.56      | 15.06      | 18.07      |
| 18                  | 7.11           | 8.53       | 10.67      | 12.80      | 14.23      | 17.07      |
| 19                  | 6.74           | 8.09       | 10.11      | 12.13      | 13.48      | 16.17      |
| 20                  | 6.40           | 7.68       | 9.60       | 11.52      | 12.80      | 15.36      |
| 21                  | 6.10           | 7.32       | 9.14       | 10.97      | 12.19      | 14.63      |
| 22                  | 5.82           | 6.98       | 8.73       | 10.48      | 11.64      | 13.97      |
| 23                  | 5.57           | 6.68       | 8.35       | 10.02      | 11.13      | 13.36      |
| 24                  | 5.33           | 6.40       | 8.00       | 9.60       | 10.67      | 12.80      |
| 25                  | 5.12           | 6.15       | 7.68       | 9.22       | 10.24      | 12.29      |
| 26                  | 4.92           | 5.91       | 7.39       | 8.86       | 9.85       | 11.82      |
| 27                  | 4.74           | 5.69       | 7.11       | 8.54       | 9.48       | 11.38      |
| 28                  | 4.57           | 5.49       | 6.86       | 8.23       | 9.14       | 10.97      |
| 29                  | 4.41           | 5.30       | 6.62       | 7.95       | 8.83       | 10.60      |
| 30                  | 4.27           | 5.12       | 6.40       | 7.68       | 8.54       | 10.24      |
| 31                  | 4.13           | 4.96       | 6.19       | 7.43       | 8.26       | 9.91       |
| 32                  | 4.00           | 4.80       | 6.00       | 7.20       | 8.00       | 9.60       |
| 33                  | 3.88           | 4.66       | 5.82       | 6.98       | 7.76       | 9.31       |
| 34                  | 3.77           | 4.52       | 5.65       | 6.78       | 7.53       | 9.04       |
| 35                  | 3.66           | 4.39       | 5.49       | 6.58       | 7.32       | 8.78       |
| 36                  | 3.56           | 4.27       | 5.33       | 6.40       | 7.11       | 8.54       |
| 37                  | 3.46           | 4.15       | 5.19       | 6.23       | 6.92       | 8.30       |
| 38                  | 3.37           | 4.04       | 5.05       | 6.06       | 6.74       | 8.09       |
| 39                  | 3.28           | 3.94       | 4.92       | 5.91       | 6.57       | 7.88       |
| 40                  | 3.20           | 3.84       | 4.80       | 5.76       | 6.40       | 7.68       |
| 41                  | 3.12           | 3.75       | 4.68       | 5.62       | 6.25       | 7.49       |
| 42                  | 3.05           | 3.66       | 4.57       | 5.49       | 6.10       | 7.32       |
| 43                  | 2.98           | 3.57       | 4.47       | 5.36       | 5.95       | 7.15       |
| 44                  | 2.91           | 3.49       | 4.36       | 5.24       | 5.82       | 6.98       |
| 45                  | 2.85           | 3.41       | 4.27       | 5.12       | 5.69       | 6.83       |
| 46                  | 2.78           | 3.34       | 4.17       | 5.01       | 5.57       | 6.68       |
| 47                  | 2.72           | 3.27       | 4.09       | 4.90       | 5.45       | 6.54       |
| 48                  | 2.67           | 3.20       | 4.00       | 4.80       | 5.33       | 6.40       |
| 49                  | 2.61           | 3.14       | 3.92       | 4.70       | 5.23       | 6.27       |
| 50                  | 2.56           | 3.07       | 3.84       | 4.61       | 5.12       | 6.15       |
| 51                  | 2.51           | 3.01       | 3.77       | 4.52       | 5.02       | 6.02       |
| 52                  | 2.46           | 2.95       | 3.69       | 4.43       | 4.92       | 5.91       |
| 53                  | 2.42           | 2.90       | 3.62       | 4.35       | 4.83       | 5.80       |
| 54                  | 2.37           | 2.85       | 3.56       | 4.27       | 4.74       | 5.69       |
| 55                  | 2.33           | 2.79       | 3.49       | 4.19       | 4.66       | 5.59       |
| 56                  | 2.29           | 2.74       | 3.43       | 4.12       | 4.57       | 5.49       |
| 57                  | 2.25           | 2.70       | 3.37       | 4.04       | 4.49       | 5.39       |
| 58                  | 2.21           | 2.65       | 3.31       | 3.97       | 4.41       | 5.30       |
| 59                  | 2.17           | 2.60       | 3.25       | 3.91       | 4.34       | 5.21       |
| 60                  | 2.13           | 2.56       | 3.20       | 3.84       | 4.27       | 5.12       |
| Constants           | 128.03         | 153.63     | 192.04     | 230.45     | 256.05     | 307.26     |



# TWIST GEARING TABLE—(Continued)

36" AND 39" TWISTERS

**CYLINDER 7 INCHES DIAM. WHIRL 1 $\frac{5}{8}$  INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 4.04

**FRONT ROLL 1 $\frac{1}{2}$  INCHES DIAM. FRONT ROLL GEAR 112 TEETH**

| Change<br>Gears | TWIST PER INCH |             |             |             |             |             |
|-----------------|----------------|-------------|-------------|-------------|-------------|-------------|
|                 | Cyl. 30 T.     | Cyl. 27 T.  | Cyl. 24 T.  | Cyl. 24 T.  | Cyl. 21 T.  | Cyl. 18 T.  |
|                 | Jack 112 T.    | Jack 112 T. | Jack 112 T. | Jack 120 T. | Jack 120 T. | Jack 120 T. |
| 16              | 22.40          | 24.89       | 28.01       | 30.01       | 34.29       | 40.01       |
| 17              | 21.09          | 23.43       | 26.36       | 28.24       | 32.28       | 37.65       |
| 18              | 19.92          | 22.13       | 24.89       | 26.67       | 30.48       | 35.56       |
| 19              | 18.87          | 20.96       | 23.58       | 25.27       | 28.88       | 33.69       |
| 20              | 17.92          | 19.92       | 22.40       | 24.01       | 27.43       | 32.01       |
| 21              | 17.07          | 18.97       | 21.34       | 22.86       | 26.13       | 30.48       |
| 22              | 16.29          | 18.10       | 20.37       | 21.82       | 24.94       | 29.10       |
| 23              | 15.59          | 17.32       | 19.48       | 20.87       | 23.86       | 27.83       |
| 24              | 14.94          | 16.60       | 18.67       | 20.00       | 22.86       | 26.67       |
| 25              | 14.34          | 15.93       | 17.92       | 19.20       | 21.95       | 25.61       |
| 26              | 13.79          | 15.32       | 17.23       | 18.46       | 21.10       | 24.62       |
| 27              | 13.28          | 14.75       | 16.60       | 17.78       | 20.32       | 23.71       |
| 28              | 12.80          | 14.23       | 16.00       | 17.15       | 19.60       | 22.86       |
| 29              | 12.36          | 13.73       | 15.45       | 16.56       | 18.92       | 22.07       |
| 30              | 11.95          | 13.28       | 14.94       | 16.00       | 18.29       | 21.34       |
| 31              | 11.56          | 12.85       | 14.45       | 15.49       | 17.70       | 20.65       |
| 32              | 11.20          | 12.45       | 14.00       | 15.00       | 17.15       | 20.00       |
| 33              | 10.86          | 12.07       | 13.58       | 14.55       | 16.63       | 19.40       |
| 34              | 10.54          | 11.71       | 13.18       | 14.12       | 16.14       | 18.83       |
| 35              | 10.24          | 11.38       | 12.80       | 13.72       | 15.68       | 18.29       |
| 36              | 9.96           | 11.06       | 12.45       | 13.34       | 15.24       | 17.78       |
| 37              | 9.69           | 10.76       | 12.11       | 12.98       | 14.83       | 17.30       |
| 38              | 9.43           | 10.48       | 11.79       | 12.63       | 14.44       | 16.85       |
| 39              | 9.19           | 10.21       | 11.49       | 12.31       | 14.07       | 16.41       |
| 40              | 8.96           | 9.96        | 11.20       | 12.00       | 13.72       | 16.00       |
| 41              | 8.74           | 9.71        | 10.93       | 11.71       | 13.38       | 15.61       |
| 42              | 8.54           | 9.48        | 10.67       | 11.43       | 13.06       | 15.24       |
| 43              | 8.34           | 9.26        | 10.42       | 11.16       | 12.76       | 14.89       |
| 44              | 8.15           | 9.05        | 10.18       | 10.91       | 12.47       | 14.55       |
| 45              | 7.97           | 8.85        | 9.96        | 10.67       | 12.19       | 14.23       |
| 46              | 7.79           | 8.66        | 9.74        | 10.44       | 11.93       | 13.92       |
| 47              | 7.63           | 8.47        | 9.53        | 10.21       | 11.67       | 13.62       |
| 48              | 7.47           | 8.30        | 9.33        | 10.00       | 11.43       | 13.34       |
| 49              | 7.32           | 8.13        | 9.14        | 9.80        | 11.20       | 13.06       |
| 50              | 7.17           | 7.97        | 8.96        | 9.60        | 10.97       | 12.80       |
| 51              | 7.03           | 7.81        | 8.79        | 9.41        | 10.76       | 12.55       |
| 52              | 6.89           | 7.66        | 8.62        | 9.23        | 10.55       | 12.31       |
| 53              | 6.76           | 7.52        | 8.45        | 9.06        | 10.35       | 12.08       |
| 54              | 6.64           | 7.38        | 8.30        | 8.89        | 10.16       | 11.85       |
| 55              | 6.52           | 7.24        | 8.15        | 8.73        | 9.98        | 11.64       |
| 56              | 6.40           | 7.11        | 8.00        | 8.57        | 9.80        | 11.43       |
| 57              | 6.29           | 6.99        | 7.86        | 8.42        | 9.63        | 11.23       |
| 58              | 6.18           | 6.87        | 7.73        | 8.28        | 9.46        | 10.04       |
| 59              | 6.08           | 6.75        | 7.59        | 8.14        | 9.30        | 10.85       |
| 60              | 5.97           | 6.64        | 7.47        | 8.00        | 9.14        | 10.67       |
| Constants       | 358.47         | 398.30      | 448.09      | 480.10      | 548.68      | 640.13      |

# TWIST GEARING TABLE FOR TWISTING

## TWIST GEARING TABLE

36" AND 39" TWISTERS

**CYLINDER 7 INCHES DIAM. WHIRL  $1\frac{3}{4}$  INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 3.77

FRONT ROLL  $1\frac{1}{2}$  INCHES DIAM. FRONT ROLL GEAR 112 TEETH

| Change<br><br>Gears | TWIST PER INCH |            |            |            |            |            |
|---------------------|----------------|------------|------------|------------|------------|------------|
|                     | Cyl. 60 T.     | Cyl. 50 T. | Cyl. 40 T. | Cyl. 40 T. | Cyl. 36 T  | Cyl. 30 T. |
|                     | Jack 80 T.     | Jack 80 T. | Jack 80 T. | Jack 96 T. | Jack 96 T. | Jack 96 T. |
| 16                  | 7.47           | 8.96       | 11.20      | 13.44      | 14.93      | 17.92      |
| 17                  | 7.03           | 8.43       | 10.54      | 12.65      | 14.06      | 16.87      |
| 18                  | 6.64           | 7.96       | 9.96       | 11.95      | 13.27      | 15.93      |
| 19                  | 6.29           | 7.55       | 9.43       | 11.32      | 12.58      | 15.09      |
| 20                  | 5.97           | 7.17       | 8.96       | 10.75      | 11.95      | 14.34      |
| 21                  | 5.69           | 6.83       | 8.53       | 10.24      | 11.38      | 13.65      |
| 22                  | 5.43           | 6.52       | 8.15       | 9.77       | 10.86      | 13.03      |
| 23                  | 5.19           | 6.23       | 7.79       | 9.35       | 10.39      | 12.47      |
| 24                  | 4.98           | 5.97       | 7.47       | 8.96       | 9.96       | 11.95      |
| 25                  | 4.78           | 5.73       | 7.17       | 8.60       | 9.56       | 11.47      |
| 26                  | 4.60           | 5.51       | 6.89       | 8.27       | 9.19       | 11.03      |
| 27                  | 4.42           | 5.31       | 6.64       | 7.96       | 8.85       | 10.62      |
| 28                  | 4.27           | 5.12       | 6.40       | 7.68       | 8.53       | 10.24      |
| 29                  | 4.12           | 4.94       | 6.18       | 7.42       | 8.24       | 9.89       |
| 30                  | 3.98           | 4.78       | 5.97       | 7.17       | 7.96       | 9.56       |
| 31                  | 3.85           | 4.62       | 5.78       | 6.94       | 7.71       | 9.25       |
| 32                  | 3.73           | 4.48       | 5.60       | 6.72       | 7.47       | 8.96       |
| 33                  | 3.62           | 4.34       | 5.43       | 6.52       | 7.24       | 8.69       |
| 34                  | 3.51           | 4.22       | 5.27       | 6.32       | 7.03       | 8.43       |
| 35                  | 3.41           | 4.10       | 5.12       | 6.14       | 6.83       | 8.19       |
| 36                  | 3.32           | 3.98       | 4.98       | 5.97       | 6.64       | 7.96       |
| 37                  | 3.23           | 3.87       | 4.84       | 5.81       | 6.46       | 7.75       |
| 38                  | 3.14           | 3.77       | 4.72       | 5.66       | 6.29       | 7.55       |
| 39                  | 3.06           | 3.68       | 4.59       | 5.51       | 6.13       | 7.35       |
| 40                  | 2.99           | 3.58       | 4.48       | 5.38       | 5.97       | 7.17       |
| 41                  | 2.91           | 3.50       | 4.37       | 5.24       | 5.83       | 6.99       |
| 42                  | 2.84           | 3.41       | 4.27       | 5.12       | 5.69       | 6.83       |
| 43                  | 2.78           | 3.33       | 4.17       | 5.00       | 5.56       | 6.67       |
| 44                  | 2.72           | 3.26       | 4.07       | 4.89       | 5.43       | 6.52       |
| 45                  | 2.65           | 3.19       | 3.98       | 4.78       | 5.31       | 6.37       |
| 46                  | 2.60           | 3.12       | 3.90       | 4.67       | 5.19       | 6.23       |
| 47                  | 2.54           | 3.05       | 3.81       | 4.58       | 5.08       | 6.10       |
| 48                  | 2.49           | 2.99       | 3.73       | 4.48       | 4.98       | 5.98       |
| 49                  | 2.44           | 2.93       | 3.66       | 4.39       | 4.88       | 5.85       |
| 50                  | 2.39           | 2.87       | 3.58       | 4.30       | 4.78       | 5.73       |
| 51                  | 2.34           | 2.81       | 3.51       | 4.22       | 4.69       | 5.62       |
| 52                  | 2.30           | 2.76       | 3.45       | 4.14       | 4.60       | 5.51       |
| 53                  | 2.25           | 2.70       | 3.38       | 4.06       | 4.51       | 5.41       |
| 54                  | 2.21           | 2.65       | 3.32       | 3.98       | 4.42       | 5.31       |
| 55                  | 2.17           | 2.61       | 3.26       | 3.91       | 4.34       | 5.21       |
| 56                  | 2.13           | 2.56       | 3.20       | 3.84       | 4.27       | 5.12       |
| 57                  | 2.10           | 2.52       | 3.14       | 3.77       | 4.19       | 5.03       |
| 58                  | 2.06           | 2.47       | 3.09       | 3.71       | 4.12       | 4.94       |
| 59                  | 2.02           | 2.43       | 3.04       | 3.64       | 4.05       | 4.86       |
| 60                  | 1.99           | 2.39       | 2.99       | 3.58       | 3.98       | 4.78       |
| Constants           | 119.47         | 143.36     | 179.20     | 215.04     | 238.94     | 286.73     |

# TWIST GEARING TABLE —(Continued)

36" AND 39" TWISTERS

**CYLINDER 7 INCHES DIAM. WHIRL  $1\frac{3}{4}$  INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 3.77

FRONT ROLL  $1\frac{1}{2}$  INCHES DIAM. FRONT ROLL GEAR 112 TEETH

| Change<br><br>Gears | TWIST PER INCH |             |             |             |             |             |
|---------------------|----------------|-------------|-------------|-------------|-------------|-------------|
|                     | Cyl. 30 T.     | Cyl. 27 T.  | Cyl. 24 T.  | Cyl. 24 T.  | Cyl. 21 T.  | Cyl. 18 T.  |
|                     | Jack 112 T.    | Jack 112 T. | Jack 112 T. | Jack 120 T. | Jack 120 T. | Jack 120 T. |
| 16                  | 20.91          | 23.23       | 26.13       | 28.00       | 32.00       | 37.33       |
| 17                  | 19.68          | 21.86       | 24.60       | 26.35       | 30.12       | 35.14       |
| 18                  | 18.58          | 20.65       | 23.23       | 24.89       | 28.45       | 33.19       |
| 19                  | 17.61          | 19.56       | 22.01       | 23.58       | 26.95       | 31.44       |
| 20                  | 16.73          | 18.58       | 20.91       | 22.40       | 25.60       | 29.87       |
| 21                  | 15.93          | 17.70       | 19.91       | 21.33       | 24.38       | 28.45       |
| 22                  | 15.21          | 16.89       | 19.01       | 20.36       | 23.27       | 27.15       |
| 23                  | 14.54          | 16.16       | 18.18       | 19.48       | 22.26       | 25.97       |
| 24                  | 13.94          | 15.49       | 17.42       | 18.67       | 21.33       | 24.89       |
| 25                  | 13.38          | 14.87       | 16.73       | 17.92       | 20.48       | 23.89       |
| 26                  | 12.87          | 14.30       | 16.08       | 17.23       | 19.69       | 22.98       |
| 27                  | 12.39          | 13.77       | 15.49       | 16.59       | 18.96       | 22.12       |
| 28                  | 11.95          | 13.27       | 14.93       | 16.00       | 18.29       | 21.33       |
| 29                  | 11.53          | 12.82       | 14.42       | 15.45       | 17.66       | 20.60       |
| 30                  | 11.15          | 12.39       | 13.94       | 14.93       | 17.07       | 19.91       |
| 31                  | 10.79          | 11.99       | 13.49       | 14.45       | 16.52       | 19.27       |
| 32                  | 10.45          | 11.62       | 13.07       | 14.00       | 16.00       | 18.67       |
| 33                  | 10.14          | 11.26       | 12.67       | 13.58       | 15.52       | 18.10       |
| 34                  | 9.84           | 10.93       | 12.30       | 13.18       | 15.06       | 17.57       |
| 35                  | 9.56           | 10.62       | 11.95       | 12.80       | 14.63       | 17.07       |
| 36                  | 9.29           | 10.32       | 11.62       | 12.44       | 14.22       | 16.59       |
| 37                  | 9.04           | 10.05       | 11.30       | 12.11       | 13.84       | 16.14       |
| 38                  | 8.80           | 9.78        | 11.00       | 11.79       | 13.47       | 15.72       |
| 39                  | 8.58           | 9.53        | 10.72       | 11.49       | 13.13       | 15.32       |
| 40                  | 8.36           | 9.29        | 10.45       | 11.20       | 12.80       | 14.93       |
| 41                  | 8.16           | 9.07        | 10.20       | 10.93       | 12.49       | 14.57       |
| 42                  | 7.96           | 8.85        | 9.96        | 10.67       | 12.19       | 14.22       |
| 43                  | 7.78           | 8.64        | 9.72        | 10.42       | 11.91       | 13.89       |
| 44                  | 7.60           | 8.45        | 9.50        | 10.18       | 11.64       | 13.58       |
| 45                  | 7.43           | 8.26        | 9.29        | 9.96        | 11.38       | 13.27       |
| 46                  | 7.27           | 8.08        | 9.09        | 9.74        | 11.13       | 12.99       |
| 47                  | 7.12           | 7.91        | 8.90        | 9.53        | 10.89       | 12.71       |
| 48                  | 6.97           | 7.74        | 8.71        | 9.33        | 10.67       | 12.44       |
| 49                  | 6.83           | 7.59        | 8.53        | 9.14        | 10.45       | 12.19       |
| 50                  | 6.69           | 7.43        | 8.36        | 8.96        | 10.24       | 11.95       |
| 51                  | 6.56           | 7.29        | 8.20        | 8.78        | 10.04       | 11.71       |
| 52                  | 6.43           | 7.15        | 8.04        | 8.62        | 9.85        | 11.49       |
| 53                  | 6.31           | 7.01        | 7.89        | 8.45        | 9.66        | 11.27       |
| 54                  | 6.19           | 6.88        | 7.74        | 8.30        | 9.48        | 11.06       |
| 55                  | 6.08           | 6.76        | 7.60        | 8.15        | 9.31        | 10.86       |
| 56                  | 5.97           | 6.64        | 7.47        | 8.00        | 9.14        | 10.67       |
| 57                  | 5.87           | 6.52        | 7.34        | 7.86        | 8.98        | 10.48       |
| 58                  | 5.77           | 6.41        | 7.21        | 7.72        | 8.83        | 10.30       |
| 59                  | 5.67           | 6.30        | 7.09        | 7.59        | 8.68        | 10.12       |
| 60                  | 5.58           | 6.19        | 6.97        | 7.47        | 8.53        | 9.96        |
| Constants           | 334.51         | 371.68      | 418.14      | 448.01      | 512.01      | 597.35      |

# TWIST GEARING TABLE FOR TWISTING

## TWIST GEARING TABLE

36" AND 39" TWISTERS

**CYLINDER 8 INCHES DIAM.      WHIRL 1 INCH DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 7.04

FRONT ROLL  $1\frac{1}{2}$  INCHES DIAM.      FRONT ROLL GEAR 112 TEETH

| Change<br>Gears | TWIST PER INCH           |                          |                          |                          |                          |                          |
|-----------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
|                 | Cyl. 60 T.<br>Jack 80 T. | Cyl. 50 T.<br>Jack 80 T. | Cyl. 40 T.<br>Jack 80 T. | Cyl. 40 T.<br>Jack 96 T. | Cyl. 36 T.<br>Jack 96 T. | Cyl. 30 T.<br>Jack 96 T. |
| 16              | 13.94                    | 16.73                    | 20.92                    | 25.10                    | 27.89                    | 33.46                    |
| 17              | 13.12                    | 15.75                    | 19.68                    | 23.62                    | 26.25                    | 31.50                    |
| 18              | 12.39                    | 14.87                    | 18.59                    | 22.31                    | 24.79                    | 29.75                    |
| 19              | 11.74                    | 14.09                    | 17.61                    | 21.14                    | 23.48                    | 28.18                    |
| 20              | 11.15                    | 13.39                    | 16.73                    | 20.08                    | 22.31                    | 26.77                    |
| 21              | 10.62                    | 12.75                    | 15.94                    | 19.12                    | 21.25                    | 25.50                    |
| 22              | 10.14                    | 12.17                    | 15.21                    | 18.25                    | 20.28                    | 24.34                    |
| 23              | 9.70                     | 11.64                    | 14.55                    | 17.46                    | 19.40                    | 23.28                    |
| 24              | 9.30                     | 11.15                    | 13.94                    | 16.73                    | 18.59                    | 22.31                    |
| 25              | 8.92                     | 10.71                    | 13.39                    | 16.06                    | 17.85                    | 21.42                    |
| 26              | 8.58                     | 10.30                    | 12.87                    | 15.45                    | 17.16                    | 20.59                    |
| 27              | 8.26                     | 9.92                     | 12.39                    | 14.87                    | 16.53                    | 19.83                    |
| 28              | 7.97                     | 9.56                     | 11.95                    | 14.34                    | 15.94                    | 19.12                    |
| 29              | 7.69                     | 9.23                     | 11.54                    | 13.85                    | 15.39                    | 18.46                    |
| 30              | 7.44                     | 8.92                     | 11.15                    | 13.39                    | 14.87                    | 17.85                    |
| 31              | 7.20                     | 8.64                     | 10.79                    | 12.95                    | 14.39                    | 17.27                    |
| 32              | 6.97                     | 8.37                     | 10.46                    | 12.55                    | 13.94                    | 16.73                    |
| 33              | 6.76                     | 8.11                     | 10.14                    | 12.17                    | 13.52                    | 16.22                    |
| 34              | 6.56                     | 7.87                     | 9.84                     | 11.81                    | 13.12                    | 15.75                    |
| 35              | 6.37                     | 7.65                     | 9.56                     | 11.47                    | 12.75                    | 15.30                    |
| 36              | 6.20                     | 7.44                     | 9.30                     | 11.15                    | 12.39                    | 14.87                    |
| 37              | 6.03                     | 7.24                     | 9.04                     | 10.85                    | 12.06                    | 14.47                    |
| 38              | 5.87                     | 7.05                     | 8.81                     | 10.57                    | 11.74                    | 14.09                    |
| 39              | 5.72                     | 6.86                     | 8.58                     | 10.30                    | 11.44                    | 13.73                    |
| 40              | 5.58                     | 6.69                     | 8.37                     | 10.04                    | 11.15                    | 13.39                    |
| 41              | 5.44                     | 6.53                     | 8.16                     | 9.79                     | 10.88                    | 13.06                    |
| 42              | 5.31                     | 6.38                     | 7.97                     | 9.56                     | 10.62                    | 12.75                    |
| 43              | 5.19                     | 6.23                     | 7.78                     | 9.34                     | 10.38                    | 12.45                    |
| 44              | 5.07                     | 6.08                     | 7.61                     | 9.13                     | 10.14                    | 12.17                    |
| 45              | 4.96                     | 5.95                     | 7.44                     | 8.92                     | 9.92                     | 11.90                    |
| 46              | 4.85                     | 5.82                     | 7.27                     | 8.73                     | 9.70                     | 11.64                    |
| 47              | 4.75                     | 5.70                     | 7.12                     | 8.54                     | 9.49                     | 11.39                    |
| 48              | 4.65                     | 5.58                     | 6.97                     | 8.37                     | 9.30                     | 11.16                    |
| 49              | 4.55                     | 5.46                     | 6.83                     | 8.20                     | 9.11                     | 10.93                    |
| 50              | 4.46                     | 5.35                     | 6.69                     | 8.03                     | 8.92                     | 10.71                    |
| 51              | 4.37                     | 5.25                     | 6.56                     | 7.87                     | 8.75                     | 10.50                    |
| 52              | 4.29                     | 5.15                     | 6.44                     | 7.72                     | 8.58                     | 10.30                    |
| 53              | 4.21                     | 5.05                     | 6.31                     | 7.58                     | 8.42                     | 10.10                    |
| 54              | 4.13                     | 4.96                     | 6.20                     | 7.44                     | 8.26                     | 9.92                     |
| 55              | 4.06                     | 4.87                     | 6.08                     | 7.30                     | 8.11                     | 9.73                     |
| 56              | 3.98                     | 4.78                     | 5.98                     | 7.17                     | 7.97                     | 9.56                     |
| 57              | 3.91                     | 4.70                     | 5.87                     | 7.05                     | 7.83                     | 9.39                     |
| 58              | 3.85                     | 4.62                     | 5.77                     | 6.92                     | 7.69                     | 9.23                     |
| 59              | 3.78                     | 4.54                     | 5.67                     | 6.81                     | 7.56                     | 9.07                     |
| 60              | 3.72                     | 4.46                     | 5.58                     | 6.69                     | 7.44                     | 8.92                     |
| Constants       | 223.09                   | 267.71                   | 334.64                   | 401.57                   | 446.19                   | 535.42                   |

# TWIST GEARING TABLE—(Continued)

36" AND 39" TWISTERS

CYLINDER 8 INCHES DIAM. WHIRL 1 INCH DIAM.

RATIO OF CYLINDER TO WHIRL 1 TO 7.04

FRONT ROLL 1½ INCHES DIAM. FRONT ROLL GEAR 112 TEETH

| Change<br>Gears | TWIST PER INCH            |                           |                           |                           |                           |                           |
|-----------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
|                 | Cyl. 30 T.<br>Jack 112 T. | Cyl. 27 T.<br>Jack 112 T. | Cyl. 24 T.<br>Jack 112 T. | Cyl. 24 T.<br>Jack 120 T. | Cyl. 21 T.<br>Jack 120 T. | Cyl. 18 T.<br>Jack 120 T. |
| 16              | 39.04                     | 43.38                     | 48.80                     | 52.29                     | 59.76                     | 69.72                     |
| 17              | 36.74                     | 40.83                     | 45.93                     | 49.21                     | 56.24                     | 65.62                     |
| 18              | 34.70                     | 38.56                     | 43.38                     | 46.48                     | 53.12                     | 61.97                     |
| 19              | 32.88                     | 36.53                     | 41.10                     | 44.03                     | 50.32                     | 58.71                     |
| 20              | 31.23                     | 34.70                     | 39.04                     | 41.83                     | 47.81                     | 55.77                     |
| 21              | 29.75                     | 33.05                     | 37.18                     | 39.84                     | 45.53                     | 53.12                     |
| 22              | 28.39                     | 31.55                     | 35.49                     | 38.03                     | 43.46                     | 50.70                     |
| 23              | 27.16                     | 30.18                     | 33.95                     | 36.37                     | 41.57                     | 48.50                     |
| 24              | 26.03                     | 28.92                     | 32.53                     | 34.86                     | 39.84                     | 46.48                     |
| 25              | 24.99                     | 27.76                     | 31.23                     | 33.46                     | 38.24                     | 44.62                     |
| 26              | 24.03                     | 26.70                     | 30.03                     | 32.18                     | 36.77                     | 42.90                     |
| 27              | 23.14                     | 25.71                     | 28.92                     | 30.99                     | 35.41                     | 41.31                     |
| 28              | 22.31                     | 24.79                     | 27.89                     | 29.88                     | 34.15                     | 39.84                     |
| 29              | 21.54                     | 23.93                     | 26.93                     | 28.85                     | 32.97                     | 38.46                     |
| 30              | 20.82                     | 23.14                     | 26.03                     | 27.89                     | 31.87                     | 37.18                     |
| 31              | 20.15                     | 22.39                     | 25.19                     | 26.99                     | 30.84                     | 35.98                     |
| 32              | 19.52                     | 21.69                     | 24.40                     | 26.14                     | 29.88                     | 34.86                     |
| 33              | 18.93                     | 21.03                     | 23.66                     | 25.35                     | 28.97                     | 33.80                     |
| 34              | 18.37                     | 20.41                     | 22.97                     | 24.61                     | 28.12                     | 32.81                     |
| 35              | 17.85                     | 19.83                     | 22.31                     | 23.90                     | 27.32                     | 31.87                     |
| 36              | 17.35                     | 19.28                     | 21.69                     | 23.24                     | 26.56                     | 30.99                     |
| 37              | 16.88                     | 18.76                     | 21.10                     | 22.61                     | 25.84                     | 30.15                     |
| 38              | 16.44                     | 18.27                     | 20.55                     | 22.02                     | 25.16                     | 29.36                     |
| 39              | 16.02                     | 17.80                     | 20.02                     | 21.45                     | 24.52                     | 28.60                     |
| 40              | 15.62                     | 17.35                     | 19.52                     | 20.92                     | 23.90                     | 27.89                     |
| 41              | 15.24                     | 16.93                     | 19.04                     | 20.40                     | 23.32                     | 27.21                     |
| 42              | 14.88                     | 16.53                     | 18.59                     | 19.92                     | 22.76                     | 26.56                     |
| 43              | 14.53                     | 16.14                     | 18.16                     | 19.46                     | 22.24                     | 25.94                     |
| 44              | 14.20                     | 15.77                     | 17.75                     | 19.01                     | 21.73                     | 25.35                     |
| 45              | 13.88                     | 15.42                     | 17.35                     | 18.59                     | 21.25                     | 24.79                     |
| 46              | 13.58                     | 15.09                     | 16.97                     | 18.19                     | 20.79                     | 24.25                     |
| 47              | 13.29                     | 14.77                     | 16.61                     | 17.80                     | 20.34                     | 23.73                     |
| 48              | 13.02                     | 14.46                     | 16.27                     | 17.43                     | 19.92                     | 23.24                     |
| 49              | 12.75                     | 14.16                     | 15.94                     | 17.07                     | 19.51                     | 22.76                     |
| 50              | 12.49                     | 13.88                     | 15.62                     | 16.73                     | 19.12                     | 22.31                     |
| 51              | 12.25                     | 13.61                     | 15.31                     | 16.40                     | 18.75                     | 21.87                     |
| 52              | 12.02                     | 13.35                     | 15.02                     | 16.09                     | 18.39                     | 21.45                     |
| 53              | 11.79                     | 13.10                     | 14.73                     | 15.78                     | 18.04                     | 21.05                     |
| 54              | 11.57                     | 12.85                     | 14.46                     | 15.49                     | 17.71                     | 20.66                     |
| 55              | 11.36                     | 12.62                     | 14.20                     | 15.21                     | 17.38                     | 20.28                     |
| 56              | 11.16                     | 12.40                     | 13.94                     | 14.94                     | 17.07                     | 19.92                     |
| 57              | 10.96                     | 12.18                     | 13.70                     | 14.68                     | 16.77                     | 19.57                     |
| 58              | 10.77                     | 11.97                     | 13.46                     | 14.43                     | 16.49                     | 19.23                     |
| 59              | 10.59                     | 11.76                     | 13.23                     | 14.18                     | 16.21                     | 18.91                     |
| 60              | 10.41                     | 11.57                     | 13.01                     | 13.94                     | 15.94                     | 18.59                     |
| Constants       | 624.66                    | 694.07                    | 780.83                    | 836.60                    | 956.12                    | 1115.47                   |

# TWIST GEARING TABLE FOR TWISTING

## TWIST GEARING TABLE

36" AND 39" TWISTERS

**CYLINDER 8 INCHES DIAM. WHIRL  $1\frac{1}{8}$  INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 6.39

**FRONT ROLL  $1\frac{1}{2}$  INCHES DIAM. FRONT ROLL GEAR 112 TEETH**

| Change<br>Gears | TWIST PER INCH |            |            |            |            |            |
|-----------------|----------------|------------|------------|------------|------------|------------|
|                 | Cyl. 60 T.     | Cyl. 50 T. | Cyl. 40 T. | Cyl. 40 T. | Cyl. 36 T. | Cyl. 30 T. |
|                 | Jack 80 T.     | Jack 80 T. | Jack 80 T. | Jack 96 T. | Jack 96 T. | Jack 96 T. |
| 16              | 12.66          | 15.19      | 18.98      | 22.78      | 25.31      | 30.37      |
| 17              | 11.91          | 14.29      | 17.87      | 21.44      | 23.82      | 28.59      |
| 18              | 11.25          | 13.50      | 16.87      | 20.25      | 22.50      | 27.00      |
| 19              | 10.66          | 12.79      | 15.99      | 19.18      | 21.32      | 25.58      |
| 20              | 10.13          | 12.15      | 15.19      | 18.22      | 20.25      | 24.30      |
| 21              | 9.64           | 11.57      | 14.46      | 17.36      | 19.29      | 23.14      |
| 22              | 9.20           | 11.05      | 13.81      | 16.57      | 18.41      | 22.09      |
| 23              | 8.80           | 10.56      | 13.21      | 15.85      | 17.61      | 21.13      |
| 24              | 8.44           | 10.12      | 12.66      | 15.19      | 16.87      | 20.25      |
| 25              | 8.10           | 9.72       | 12.15      | 14.58      | 16.20      | 19.44      |
| 26              | 7.79           | 9.35       | 11.68      | 14.02      | 15.58      | 18.69      |
| 27              | 7.50           | 9.00       | 11.25      | 13.50      | 15.00      | 18.00      |
| 28              | 7.23           | 8.68       | 10.85      | 13.02      | 14.46      | 17.36      |
| 29              | 6.98           | 8.38       | 10.47      | 12.57      | 13.97      | 16.76      |
| 30              | 6.75           | 8.10       | 10.12      | 12.15      | 13.50      | 16.20      |
| 31              | 6.53           | 7.84       | 9.80       | 11.76      | 13.06      | 15.68      |
| 32              | 6.33           | 7.59       | 9.49       | 11.39      | 12.66      | 15.19      |
| 33              | 6.14           | 7.36       | 9.20       | 11.05      | 12.27      | 14.73      |
| 34              | 5.96           | 7.15       | 8.93       | 10.72      | 11.91      | 14.29      |
| 35              | 5.79           | 6.94       | 8.68       | 10.41      | 11.57      | 13.89      |
| 36              | 5.63           | 6.75       | 8.44       | 10.12      | 11.25      | 13.50      |
| 37              | 5.47           | 6.57       | 8.21       | 9.85       | 10.95      | 13.13      |
| 38              | 5.33           | 6.39       | 7.99       | 9.59       | 10.66      | 12.79      |
| 39              | 5.19           | 6.23       | 7.79       | 9.35       | 10.38      | 12.46      |
| 40              | 5.06           | 6.07       | 7.59       | 9.11       | 10.12      | 12.15      |
| 41              | 4.94           | 5.93       | 7.41       | 8.89       | 9.88       | 11.85      |
| 42              | 4.82           | 5.79       | 7.23       | 8.68       | 9.64       | 11.57      |
| 43              | 4.71           | 5.65       | 7.06       | 8.48       | 9.42       | 11.30      |
| 44              | 4.60           | 5.52       | 6.90       | 8.28       | 9.20       | 11.05      |
| 45              | 4.50           | 5.40       | 6.75       | 8.10       | 9.00       | 10.80      |
| 46              | 4.40           | 5.28       | 6.60       | 7.92       | 8.80       | 10.57      |
| 47              | 4.31           | 5.17       | 6.46       | 7.76       | 8.62       | 10.34      |
| 48              | 4.22           | 5.06       | 6.33       | 7.59       | 8.44       | 10.13      |
| 49              | 4.13           | 4.96       | 6.20       | 7.44       | 8.27       | 9.92       |
| 50              | 4.05           | 4.86       | 6.07       | 7.29       | 8.10       | 9.72       |
| 51              | 3.97           | 4.76       | 5.96       | 7.15       | 7.94       | 9.53       |
| 52              | 3.89           | 4.67       | 5.84       | 7.01       | 7.79       | 9.35       |
| 53              | 3.82           | 4.58       | 5.73       | 6.88       | 7.64       | 9.17       |
| 54              | 3.75           | 4.50       | 5.62       | 6.75       | 7.50       | 9.00       |
| 55              | 3.68           | 4.42       | 5.52       | 6.63       | 7.36       | 8.84       |
| 56              | 3.62           | 4.34       | 5.42       | 6.51       | 7.23       | 8.68       |
| 57              | 3.55           | 4.26       | 5.33       | 6.39       | 7.11       | 8.53       |
| 58              | 3.49           | 4.19       | 5.24       | 6.28       | 6.98       | 8.38       |
| 59              | 3.43           | 4.12       | 5.15       | 6.18       | 6.86       | 8.24       |
| 60              | 3.38           | 4.05       | 5.06       | 6.07       | 6.75       | 8.10       |
| Constants       | 202.50         | 242.99     | 303.74     | 364.49     | 404.99     | 485.99     |



# TWIST GEARING TABLE FOR TWISTING

## TWIST GEARING TABLE—(Continued)

36" AND 39" TWISTERS

**CYLINDER 8 INCHES DIAM. WHIRL  $1\frac{1}{8}$  INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 6.39

**FRONT ROLL  $1\frac{1}{2}$  INCHES DIAM. FRONT ROLL GEAR 112 TEETH**

| Change<br><br>Gears | TWIST PER INCH |             |             |             |             |             |
|---------------------|----------------|-------------|-------------|-------------|-------------|-------------|
|                     | Cyl. 30 T.     | Cyl. 27 T.  | Cyl. 24 T.  | Cyl. 24 T.  | Cyl. 21 T.  | Cyl. 18 T.  |
|                     | Jack 112 T.    | Jack 112 T. | Jack 112 T. | Jack 120 T. | Jack 120 T. | Jack 120 T. |
| 16                  | 35.44          | 39.37       | 44.30       | 47.46       | 54.24       | 63.28       |
| 17                  | 33.35          | 37.06       | 41.69       | 44.67       | 51.05       | 59.56       |
| 18                  | 31.50          | 35.00       | 39.37       | 42.19       | 48.21       | 56.25       |
| 19                  | 29.84          | 33.16       | 37.30       | 39.97       | 45.68       | 53.29       |
| 20                  | 28.35          | 31.50       | 35.44       | 37.97       | 43.39       | 50.62       |
| 21                  | 27.00          | 30.00       | 33.75       | 36.16       | 41.33       | 48.21       |
| 22                  | 25.77          | 28.64       | 32.22       | 34.52       | 39.45       | 46.02       |
| 23                  | 24.65          | 27.39       | 30.82       | 33.02       | 37.73       | 44.02       |
| 24                  | 23.62          | 26.25       | 29.53       | 31.64       | 36.16       | 42.19       |
| 25                  | 22.68          | 25.20       | 28.35       | 30.37       | 34.71       | 40.50       |
| 26                  | 21.81          | 24.23       | 27.26       | 29.21       | 33.38       | 38.94       |
| 27                  | 21.00          | 23.33       | 26.25       | 28.12       | 32.14       | 37.50       |
| 28                  | 20.25          | 22.50       | 25.31       | 27.12       | 30.99       | 36.16       |
| 29                  | 19.55          | 21.72       | 24.44       | 26.18       | 29.93       | 34.91       |
| 30                  | 18.90          | 21.00       | 23.62       | 25.31       | 28.93       | 33.75       |
| 31                  | 18.29          | 20.32       | 22.86       | 24.50       | 27.99       | 32.66       |
| 32                  | 17.72          | 19.69       | 22.15       | 23.73       | 27.12       | 31.64       |
| 33                  | 17.18          | 19.09       | 21.48       | 23.01       | 26.30       | 30.68       |
| 34                  | 16.68          | 18.53       | 20.85       | 22.33       | 25.52       | 29.78       |
| 35                  | 16.20          | 18.00       | 20.25       | 21.70       | 24.80       | 28.93       |
| 36                  | 15.75          | 17.50       | 19.69       | 21.10       | 24.11       | 28.12       |
| 37                  | 15.32          | 17.03       | 19.15       | 20.52       | 23.46       | 27.36       |
| 38                  | 14.92          | 16.58       | 18.65       | 19.98       | 22.84       | 26.64       |
| 39                  | 14.54          | 16.15       | 18.17       | 19.47       | 22.25       | 25.96       |
| 40                  | 14.17          | 15.75       | 17.72       | 18.98       | 21.70       | 25.31       |
| 41                  | 13.83          | 15.37       | 17.29       | 18.52       | 21.17       | 24.69       |
| 42                  | 13.50          | 15.00       | 16.87       | 18.08       | 20.66       | 24.11       |
| 43                  | 13.19          | 14.65       | 16.48       | 17.66       | 20.18       | 23.55       |
| 44                  | 12.89          | 14.32       | 16.11       | 17.26       | 19.72       | 23.01       |
| 45                  | 12.60          | 14.00       | 15.75       | 16.87       | 19.29       | 22.50       |
| 46                  | 12.32          | 13.70       | 15.41       | 16.51       | 18.87       | 22.01       |
| 47                  | 12.06          | 13.40       | 15.08       | 16.16       | 18.46       | 21.54       |
| 48                  | 11.81          | 13.13       | 14.76       | 15.82       | 18.08       | 21.09       |
| 49                  | 11.57          | 12.86       | 14.46       | 15.50       | 17.71       | 20.66       |
| 50                  | 11.34          | 12.60       | 14.17       | 15.19       | 17.36       | 20.25       |
| 51                  | 11.12          | 12.35       | 13.90       | 14.89       | 17.02       | 19.85       |
| 52                  | 10.91          | 12.12       | 13.63       | 14.61       | 16.69       | 19.47       |
| 53                  | 10.70          | 11.89       | 13.37       | 14.33       | 16.37       | 19.10       |
| 54                  | 10.50          | 11.67       | 13.12       | 14.06       | 16.07       | 18.75       |
| 55                  | 10.31          | 11.45       | 12.89       | 13.81       | 15.78       | 18.41       |
| 56                  | 10.13          | 11.25       | 12.66       | 13.56       | 15.50       | 18.08       |
| 57                  | 9.95           | 11.05       | 12.43       | 13.32       | 15.23       | 17.76       |
| 58                  | 9.78           | 10.86       | 12.22       | 13.09       | 14.97       | 17.45       |
| 59                  | 9.61           | 10.68       | 12.01       | 12.87       | 14.71       | 17.16       |
| 60                  | 9.45           | 10.50       | 11.81       | 12.66       | 14.46       | 16.87       |
| Constants           | 566.99         | 629.99      | 708.73      | 759.36      | 867.84      | 1012.48     |

**TWIST GEARING TABLE**

36" AND 39" TWISTERS

**CYLINDER 8 INCHES DIAM. WHIRL  $1\frac{1}{4}$  INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 5.83

**FRONT ROLL  $1\frac{1}{2}$  INCHES DIAM. FRONT ROLL GEAR 112 TEETH**

| Change<br><br>Gears | TWIST PER INCH |            |            |            |            |            |
|---------------------|----------------|------------|------------|------------|------------|------------|
|                     | Cyl. 60 T.     | Cyl. 50 T. | Cyl. 40 T. | Cyl. 40 T. | Cyl. 36 T. | Cyl. 30 T. |
|                     | Jack 80 T.     | Jack 80 T. | Jack 80 T. | Jack 96 T. | Jack 96 T. | Jack 96 T. |
| 16                  | 11.55          | 13.86      | 17.32      | 20.78      | 23.09      | 27.71      |
| 17                  | 10.87          | 13.04      | 16.30      | 19.56      | 21.74      | 26.08      |
| 18                  | 10.26          | 12.32      | 15.40      | 18.48      | 20.53      | 24.63      |
| 19                  | 9.72           | 11.67      | 14.59      | 17.50      | 19.45      | 23.34      |
| 20                  | 9.24           | 11.09      | 13.86      | 16.63      | 18.48      | 22.17      |
| 21                  | 8.80           | 10.56      | 13.20      | 15.84      | 17.60      | 21.11      |
| 22                  | 8.40           | 10.08      | 12.60      | 15.12      | 16.80      | 20.15      |
| 23                  | 8.03           | 9.64       | 12.05      | 14.46      | 16.07      | 19.28      |
| 24                  | 7.70           | 9.24       | 11.55      | 13.86      | 15.40      | 18.48      |
| 25                  | 7.39           | 8.87       | 11.08      | 13.30      | 14.78      | 17.74      |
| 26                  | 7.11           | 8.53       | 10.66      | 12.79      | 14.21      | 17.05      |
| 27                  | 6.84           | 8.21       | 10.26      | 12.32      | 13.69      | 16.42      |
| 28                  | 6.60           | 7.92       | 9.90       | 11.88      | 13.20      | 15.84      |
| 29                  | 6.37           | 7.64       | 9.56       | 11.47      | 12.74      | 15.29      |
| 30                  | 6.16           | 7.39       | 9.24       | 11.09      | 12.32      | 14.78      |
| 31                  | 5.96           | 7.15       | 8.94       | 10.73      | 11.92      | 14.30      |
| 32                  | 5.77           | 6.93       | 8.66       | 10.39      | 11.55      | 13.86      |
| 33                  | 5.60           | 6.72       | 8.40       | 10.08      | 11.20      | 13.44      |
| 34                  | 5.43           | 6.52       | 8.15       | 9.78       | 10.87      | 13.04      |
| 35                  | 5.28           | 6.33       | 7.92       | 9.50       | 10.56      | 12.67      |
| 36                  | 5.13           | 6.15       | 7.70       | 9.24       | 10.26      | 12.32      |
| 37                  | 4.99           | 5.99       | 7.49       | 8.99       | 9.99       | 11.98      |
| 38                  | 4.86           | 5.83       | 7.29       | 8.75       | 9.72       | 11.67      |
| 39                  | 4.74           | 5.68       | 7.11       | 8.53       | 9.47       | 11.37      |
| 40                  | 4.62           | 5.54       | 6.93       | 8.31       | 9.24       | 11.09      |
| 41                  | 4.51           | 5.41       | 6.76       | 8.11       | 9.01       | 10.81      |
| 42                  | 4.40           | 5.28       | 6.60       | 7.92       | 8.80       | 10.56      |
| 43                  | 4.30           | 5.16       | 6.44       | 7.73       | 8.59       | 10.31      |
| 44                  | 4.20           | 5.04       | 6.30       | 7.56       | 8.40       | 10.08      |
| 45                  | 4.11           | 4.93       | 6.16       | 7.39       | 8.21       | 9.85       |
| 46                  | 4.02           | 4.82       | 6.02       | 7.23       | 8.03       | 9.64       |
| 47                  | 3.93           | 4.72       | 5.90       | 7.08       | 7.86       | 9.43       |
| 48                  | 3.85           | 4.62       | 5.77       | 6.93       | 7.70       | 9.24       |
| 49                  | 3.77           | 4.52       | 5.66       | 6.79       | 7.54       | 9.05       |
| 50                  | 3.70           | 4.43       | 5.54       | 6.65       | 7.39       | 8.87       |
| 51                  | 3.62           | 4.35       | 5.43       | 6.52       | 7.25       | 8.70       |
| 52                  | 3.55           | 4.26       | 5.33       | 6.40       | 7.11       | 8.52       |
| 53                  | 3.49           | 4.18       | 5.23       | 6.27       | 6.97       | 8.36       |
| 54                  | 3.42           | 4.11       | 5.13       | 6.16       | 6.84       | 8.21       |
| 55                  | 3.36           | 4.03       | 5.04       | 6.05       | 6.72       | 8.06       |
| 56                  | 3.30           | 3.96       | 4.95       | 5.94       | 6.60       | 7.92       |
| 57                  | 3.24           | 3.89       | 4.86       | 5.83       | 6.48       | 7.78       |
| 58                  | 3.19           | 3.82       | 4.78       | 5.73       | 6.37       | 7.64       |
| 59                  | 3.13           | 3.76       | 4.70       | 5.64       | 6.26       | 7.52       |
| 60                  | 3.08           | 3.70       | 4.62       | 5.54       | 6.16       | 7.39       |
| Constants           | 184.75         | 221.70     | 277.12     | 332.55     | 369.50     | 443.40     |

# TWIST GEARING TABLE—(Continued)

36" AND 39" TWISTERS

CYLINDER 8 INCHES DIAM. WHIRL  $1\frac{1}{4}$  INCHES DIAM.

RATIO OF CYLINDER TO WHIRL 1 TO 5.83

FRONT ROLL  $1\frac{1}{2}$  INCHES DIAM. FRONT ROLL GEAR 112 TEETH

## TWIST PER INCH

| Change    |             |             |             |             |             |             |
|-----------|-------------|-------------|-------------|-------------|-------------|-------------|
| Gears     | Cyl. 30 T.  | Cyl. 27 T.  | Cyl. 24 T.  | Cyl. 24 T.  | Cyl. 21 T.  | Cyl. 18 T.  |
|           | Jack 112 T. | Jack 112 T. | Jack 112 T. | Jack 120 T. | Jack 120 T. | Jack 120 T. |
| 16        | 32.33       | 35.92       | 40.41       | 43.30       | 49.49       | 57.73       |
| 17        | 30.43       | 33.81       | 38.04       | 40.75       | 46.58       | 54.34       |
| 18        | 28.74       | 31.93       | 35.92       | 38.49       | 43.99       | 51.32       |
| 19        | 27.23       | 30.25       | 34.03       | 36.46       | 41.67       | 48.62       |
| 20        | 25.87       | 28.74       | 32.33       | 34.64       | 39.59       | 46.19       |
| 21        | 24.63       | 27.37       | 30.79       | 32.99       | 37.70       | 43.99       |
| 22        | 23.51       | 26.13       | 29.39       | 31.49       | 35.99       | 41.99       |
| 23        | 22.49       | 24.99       | 28.11       | 30.12       | 34.43       | 40.16       |
| 24        | 21.55       | 23.95       | 26.94       | 28.87       | 32.99       | 38.49       |
| 25        | 20.69       | 22.99       | 25.86       | 27.71       | 31.67       | 36.95       |
| 26        | 19.90       | 22.11       | 24.87       | 26.65       | 30.45       | 35.53       |
| 27        | 19.16       | 21.29       | 23.95       | 25.66       | 29.33       | 34.21       |
| 28        | 18.48       | 20.53       | 23.09       | 24.74       | 28.28       | 32.99       |
| 29        | 17.84       | 19.82       | 22.30       | 23.89       | 27.30       | 31.85       |
| 30        | 17.24       | 19.16       | 21.55       | 23.09       | 26.39       | 30.79       |
| 31        | 16.69       | 18.54       | 20.86       | 22.35       | 25.54       | 29.80       |
| 32        | 16.17       | 17.96       | 20.21       | 21.65       | 24.74       | 28.87       |
| 33        | 15.68       | 17.42       | 19.59       | 20.99       | 23.99       | 27.99       |
| 34        | 15.21       | 16.91       | 19.02       | 20.38       | 23.29       | 27.17       |
| 35        | 14.78       | 16.42       | 18.47       | 19.79       | 22.62       | 26.39       |
| 36        | 14.37       | 15.97       | 17.96       | 19.24       | 21.99       | 25.66       |
| 37        | 13.98       | 15.53       | 17.48       | 18.72       | 21.40       | 24.97       |
| 38        | 13.61       | 15.13       | 17.02       | 18.23       | 20.84       | 24.31       |
| 39        | 13.26       | 14.74       | 16.58       | 17.76       | 20.30       | 23.69       |
| 40        | 12.93       | 14.37       | 16.17       | 17.32       | 19.79       | 23.09       |
| 41        | 12.62       | 14.02       | 15.77       | 16.90       | 19.31       | 22.53       |
| 42        | 12.32       | 13.69       | 15.40       | 16.50       | 18.85       | 21.99       |
| 43        | 12.03       | 13.37       | 15.04       | 16.11       | 18.41       | 21.48       |
| 44        | 11.76       | 13.06       | 14.70       | 15.75       | 18.00       | 20.99       |
| 45        | 11.50       | 12.77       | 14.37       | 15.40       | 17.60       | 20.53       |
| 46        | 11.25       | 12.50       | 14.06       | 15.06       | 17.21       | 20.08       |
| 47        | 11.01       | 12.23       | 13.76       | 14.74       | 16.85       | 19.65       |
| 48        | 10.78       | 11.97       | 13.47       | 14.43       | 16.50       | 19.24       |
| 49        | 10.56       | 11.73       | 13.20       | 14.14       | 16.16       | 18.85       |
| 50        | 10.35       | 11.50       | 12.93       | 13.86       | 15.84       | 18.48       |
| 51        | 10.14       | 11.27       | 12.68       | 13.58       | 15.52       | 18.11       |
| 52        | 9.95        | 11.05       | 12.44       | 13.32       | 15.23       | 17.76       |
| 53        | 9.76        | 10.84       | 12.20       | 13.07       | 14.94       | 17.43       |
| 54        | 9.58        | 10.64       | 11.97       | 12.83       | 14.66       | 17.11       |
| 55        | 9.41        | 10.45       | 11.76       | 12.60       | 14.40       | 16.80       |
| 56        | 9.24        | 10.26       | 11.55       | 12.37       | 14.14       | 16.50       |
| 57        | 9.08        | 10.08       | 11.34       | 12.15       | 13.89       | 16.21       |
| 58        | 8.92        | 9.91        | 11.15       | 11.95       | 13.65       | 15.93       |
| 59        | 8.77        | 9.74        | 10.96       | 11.74       | 13.42       | 15.66       |
| 60        | 8.62        | 9.58        | 10.78       | 11.55       | 13.20       | 15.40       |
| Constants | 517.30      | 574.78      | 646.62      | 692.81      | 791.78      | 923.75      |

# TWIST GEARING TABLE

36" AND 39" TWISTERS

**CYLINDER 8 INCHES DIAM.    WHIRL  $1\frac{3}{8}$  INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 5.35

**FRONT ROLL  $1\frac{1}{2}$  INCHES DIAM.    FRONT ROLL GEAR 112 TEETH**

| Change<br><br>Gears | TWIST PER INCH |            |            |            |            |            |
|---------------------|----------------|------------|------------|------------|------------|------------|
|                     | Cyl. 60 T.     | Cyl. 50 T. | Cyl. 40 T. | Cyl. 40 T. | Cyl. 36 T. | Cyl. 30 T. |
|                     | Jack 80 T.     | Jack 80 T. | Jack 80 T. | Jack 96 T. | Jack 96 T. | Jack 96 T. |
| 16                  | 10.60          | 12.72      | 15.89      | 19.07      | 21.23      | 25.43      |
| 17                  | 9.97           | 11.97      | 14.96      | 17.95      | 19.98      | 23.93      |
| 18                  | 9.42           | 11.30      | 14.13      | 16.95      | 18.87      | 22.61      |
| 19                  | 8.92           | 10.71      | 13.38      | 16.06      | 17.88      | 21.42      |
| 20                  | 8.48           | 10.17      | 12.72      | 15.26      | 16.99      | 20.34      |
| 21                  | 8.07           | 9.69       | 12.11      | 14.53      | 16.18      | 19.38      |
| 22                  | 7.71           | 9.25       | 11.56      | 13.87      | 15.44      | 18.50      |
| 23                  | 7.37           | 8.85       | 11.06      | 13.27      | 14.77      | 17.69      |
| 24                  | 7.06           | 8.48       | 10.60      | 12.72      | 14.15      | 16.95      |
| 25                  | 6.78           | 8.14       | 10.17      | 12.21      | 13.59      | 16.28      |
| 26                  | 6.52           | 7.83       | 9.78       | 11.74      | 13.07      | 15.65      |
| 27                  | 6.28           | 7.54       | 9.42       | 11.30      | 12.58      | 15.07      |
| 28                  | 6.06           | 7.27       | 9.08       | 10.90      | 12.13      | 14.53      |
| 29                  | 5.85           | 7.02       | 8.77       | 10.52      | 11.71      | 14.03      |
| 30                  | 5.65           | 6.78       | 8.48       | 10.17      | 11.32      | 13.56      |
| 31                  | 5.47           | 6.56       | 8.20       | 9.84       | 10.96      | 13.13      |
| 32                  | 5.30           | 6.36       | 7.95       | 9.54       | 10.62      | 12.72      |
| 33                  | 5.14           | 6.17       | 7.71       | 9.25       | 10.29      | 12.33      |
| 34                  | 4.99           | 5.98       | 7.48       | 8.98       | 9.99       | 11.97      |
| 35                  | 4.84           | 5.81       | 7.27       | 8.72       | 9.71       | 11.63      |
| 36                  | 4.71           | 5.65       | 7.06       | 8.48       | 9.44       | 11.30      |
| 37                  | 4.58           | 5.50       | 6.87       | 8.25       | 9.18       | 11.00      |
| 38                  | 4.46           | 5.35       | 6.69       | 8.03       | 8.94       | 10.71      |
| 39                  | 4.35           | 5.22       | 6.52       | 7.82       | 8.71       | 10.43      |
| 40                  | 4.24           | 5.09       | 6.36       | 7.63       | 8.49       | 10.17      |
| 41                  | 4.14           | 4.96       | 6.20       | 7.44       | 8.29       | 9.92       |
| 42                  | 4.04           | 4.84       | 6.06       | 7.27       | 8.09       | 9.69       |
| 43                  | 3.94           | 4.73       | 5.91       | 7.10       | 7.90       | 9.46       |
| 44                  | 3.85           | 4.62       | 5.78       | 6.94       | 7.72       | 9.25       |
| 45                  | 3.77           | 4.52       | 5.65       | 6.78       | 7.55       | 9.04       |
| 46                  | 3.69           | 4.42       | 5.53       | 6.63       | 7.39       | 8.85       |
| 47                  | 3.61           | 4.33       | 5.41       | 6.49       | 7.23       | 8.66       |
| 48                  | 3.53           | 4.24       | 5.30       | 6.36       | 7.08       | 8.48       |
| 49                  | 3.46           | 4.15       | 5.19       | 6.23       | 6.93       | 8.30       |
| 50                  | 3.39           | 4.07       | 5.09       | 6.10       | 6.79       | 8.14       |
| 51                  | 3.32           | 3.99       | 4.99       | 5.98       | 6.66       | 7.98       |
| 52                  | 3.26           | 3.91       | 4.89       | 5.87       | 6.53       | 7.82       |
| 53                  | 3.20           | 3.84       | 4.80       | 5.76       | 6.41       | 7.68       |
| 54                  | 3.14           | 3.77       | 4.71       | 5.65       | 6.29       | 7.54       |
| 55                  | 3.08           | 3.70       | 4.62       | 5.55       | 6.18       | 7.40       |
| 56                  | 3.03           | 3.63       | 4.54       | 5.45       | 6.07       | 7.27       |
| 57                  | 2.97           | 3.57       | 4.46       | 5.35       | 5.96       | 7.14       |
| 58                  | 2.92           | 3.51       | 4.38       | 5.26       | 5.86       | 7.02       |
| 59                  | 2.87           | 3.45       | 4.31       | 5.17       | 5.76       | 6.90       |
| 60                  | 2.83           | 3.39       | 4.24       | 5.09       | 5.66       | 6.78       |
| Constants           | 169.54         | 203.45     | 254.31     | 305.17     | 339.71     | 406.89     |

# TWIST GEARING TABLE—(Continued)

36" AND 39" TWISTERS

**CYLINDER 8 INCHES DIAM. WHIRL  $1\frac{3}{8}$  INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 5.35

**FRONT ROLL  $1\frac{1}{2}$  INCHES DIAM. FRONT ROLL GEAR 112 TEETH**

| Change<br>Gears | TWIST PER INCH |             |             |             |             |             |
|-----------------|----------------|-------------|-------------|-------------|-------------|-------------|
|                 | Cyl. 30 T.     | Cyl. 27 T.  | Cyl. 24 T.  | Cyl. 24 T.  | Cyl. 21 T.  | Cyl. 18 T.  |
|                 | Jack 112 T.    | Jack 112 T. | Jack 112 T. | Jack 120 T. | Jack 120 T. | Jack 120 T. |
| 16              | 29.67          | 32.97       | 37.09       | 39.61       | 45.41       | 52.98       |
| 17              | 27.92          | 31.03       | 34.90       | 37.28       | 42.74       | 49.86       |
| 18              | 26.37          | 29.30       | 32.97       | 35.21       | 40.37       | 47.09       |
| 19              | 24.98          | 27.76       | 31.23       | 33.36       | 38.24       | 44.62       |
| 20              | 23.74          | 26.37       | 29.67       | 31.69       | 36.33       | 42.38       |
| 21              | 22.61          | 25.12       | 28.26       | 30.18       | 34.60       | 40.37       |
| 22              | 21.58          | 23.98       | 26.97       | 28.81       | 33.03       | 38.53       |
| 23              | 20.64          | 22.93       | 25.80       | 27.56       | 31.59       | 36.86       |
| 24              | 19.78          | 21.98       | 24.72       | 26.41       | 30.27       | 35.32       |
| 25              | 18.99          | 21.10       | 23.74       | 25.35       | 29.06       | 33.91       |
| 26              | 18.26          | 20.29       | 22.82       | 24.38       | 27.95       | 32.60       |
| 27              | 17.58          | 19.54       | 21.98       | 23.47       | 26.91       | 31.40       |
| 28              | 16.95          | 18.84       | 21.19       | 22.63       | 25.95       | 30.27       |
| 29              | 16.37          | 18.19       | 20.46       | 21.85       | 25.05       | 29.23       |
| 30              | 15.82          | 17.58       | 19.78       | 21.13       | 24.22       | 28.26       |
| 31              | 15.31          | 17.01       | 19.14       | 20.44       | 23.44       | 27.34       |
| 32              | 14.83          | 16.48       | 18.54       | 19.81       | 22.71       | 26.49       |
| 33              | 14.39          | 15.98       | 17.98       | 19.21       | 22.02       | 25.69       |
| 34              | 13.96          | 15.51       | 17.45       | 18.64       | 21.37       | 24.93       |
| 35              | 13.56          | 15.07       | 16.95       | 18.11       | 20.76       | 24.22       |
| 36              | 13.19          | 14.65       | 16.48       | 17.60       | 20.18       | 23.55       |
| 37              | 12.83          | 14.26       | 16.04       | 17.13       | 19.64       | 22.91       |
| 38              | 12.49          | 13.88       | 15.62       | 16.68       | 19.12       | 22.31       |
| 39              | 12.17          | 13.52       | 15.21       | 16.25       | 18.63       | 21.74       |
| 40              | 11.87          | 13.19       | 14.83       | 15.84       | 18.16       | 21.19       |
| 41              | 11.58          | 12.87       | 14.47       | 15.46       | 17.72       | 20.68       |
| 42              | 11.30          | 12.56       | 14.13       | 15.09       | 17.30       | 20.18       |
| 43              | 11.04          | 12.27       | 13.80       | 14.74       | 16.90       | 19.71       |
| 44              | 10.79          | 11.99       | 13.49       | 14.40       | 16.51       | 19.27       |
| 45              | 10.55          | 11.72       | 13.19       | 14.08       | 16.15       | 18.84       |
| 46              | 10.32          | 11.47       | 12.90       | 13.78       | 15.80       | 18.43       |
| 47              | 10.10          | 11.22       | 12.63       | 13.48       | 15.46       | 18.04       |
| 48              | 9.89           | 10.99       | 12.36       | 13.20       | 15.14       | 17.66       |
| 49              | 9.69           | 10.76       | 12.11       | 12.93       | 14.83       | 17.30       |
| 50              | 9.49           | 10.55       | 11.87       | 12.68       | 14.53       | 16.95       |
| 51              | 9.31           | 10.34       | 11.63       | 12.43       | 14.25       | 16.62       |
| 52              | 9.13           | 10.14       | 11.41       | 12.19       | 13.97       | 16.30       |
| 53              | 8.96           | 9.95        | 11.20       | 11.96       | 13.71       | 15.99       |
| 54              | 8.79           | 9.77        | 10.99       | 11.74       | 13.46       | 15.70       |
| 55              | 8.63           | 9.59        | 10.79       | 11.52       | 13.21       | 15.41       |
| 56              | 8.48           | 9.42        | 10.60       | 11.32       | 12.98       | 15.14       |
| 57              | 8.33           | 9.25        | 10.41       | 11.12       | 12.75       | 14.87       |
| 58              | 8.18           | 9.09        | 10.23       | 10.93       | 12.53       | 14.62       |
| 59              | 8.05           | 8.94        | 10.06       | 10.74       | 12.32       | 14.37       |
| 60              | 7.91           | 8.79        | 9.89        | 10.56       | 12.11       | 14.13       |
| Constants       | 474.71         | 527.45      | 593.38      | 633.77      | 726.59      | 847.69      |

# TWIST GEARING TABLE FOR TWISTING

## TWIST GEARING TABLE

36" AND 39" TWISTERS

**CYLINDER 8 INCHES DIAM. WHIRL 1½ INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 4.95

**FRONT ROLL 1½ INCHES DIAM. FRONT ROLL GEAR 112 TEETH**

| Change<br>Gears | TWIST PER INCH           |                          |                          |                          |                          |                          |
|-----------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
|                 | Cyl. 60 T.<br>Jack 80 T. | Cyl. 50 T.<br>Jack 80 T. | Cyl. 40 T.<br>Jack 80 T. | Cyl. 40 T.<br>Jack 96 T. | Cyl. 36 T.<br>Jack 96 T. | Cyl. 30 T.<br>Jack 96 T. |
| 16              | 9.80                     | 11.77                    | 14.71                    | 17.65                    | 19.61                    | 23.53                    |
| 17              | 9.23                     | 11.07                    | 13.84                    | 16.61                    | 18.45                    | 22.15                    |
| 18              | 8.71                     | 10.46                    | 13.07                    | 15.69                    | 17.43                    | 20.92                    |
| 19              | 8.26                     | 9.91                     | 12.38                    | 14.86                    | 16.51                    | 19.81                    |
| 20              | 7.84                     | 9.41                     | 11.76                    | 14.12                    | 15.69                    | 18.82                    |
| 21              | 7.47                     | 8.96                     | 11.20                    | 13.45                    | 14.94                    | 17.93                    |
| 22              | 7.13                     | 8.56                     | 10.70                    | 12.83                    | 14.26                    | 17.11                    |
| 23              | 6.82                     | 8.19                     | 10.23                    | 12.28                    | 13.64                    | 16.37                    |
| 24              | 6.54                     | 7.84                     | 9.80                     | 11.76                    | 13.07                    | 15.69                    |
| 25              | 6.27                     | 7.53                     | 9.41                     | 11.29                    | 12.55                    | 15.06                    |
| 26              | 6.03                     | 7.24                     | 9.05                     | 10.86                    | 12.07                    | 14.48                    |
| 27              | 5.81                     | 6.97                     | 8.71                     | 10.46                    | 12.62                    | 13.94                    |
| 28              | 5.60                     | 6.72                     | 8.40                     | 10.08                    | 11.20                    | 13.45                    |
| 29              | 5.41                     | 6.49                     | 8.11                     | 9.74                     | 10.82                    | 12.98                    |
| 30              | 5.23                     | 6.27                     | 7.84                     | 9.41                     | 10.46                    | 12.55                    |
| 31              | 5.06                     | 6.07                     | 7.59                     | 9.11                     | 10.12                    | 12.14                    |
| 32              | 4.90                     | 5.88                     | 7.35                     | 8.82                     | 9.80                     | 11.76                    |
| 33              | 4.75                     | 5.70                     | 7.13                     | 8.56                     | 9.51                     | 11.41                    |
| 34              | 4.61                     | 5.54                     | 6.92                     | 8.30                     | 9.23                     | 11.07                    |
| 35              | 4.48                     | 5.38                     | 6.72                     | 8.07                     | 8.96                     | 10.76                    |
| 36              | 4.36                     | 5.23                     | 6.54                     | 7.84                     | 8.71                     | 10.46                    |
| 37              | 4.24                     | 5.09                     | 6.36                     | 7.63                     | 8.48                     | 10.17                    |
| 38              | 4.13                     | 4.95                     | 6.19                     | 7.43                     | 8.26                     | 9.91                     |
| 39              | 4.02                     | 4.83                     | 6.03                     | 7.24                     | 8.04                     | 9.65                     |
| 40              | 3.92                     | 4.71                     | 5.88                     | 7.06                     | 7.84                     | 9.41                     |
| 41              | 3.83                     | 4.59                     | 5.74                     | 6.89                     | 7.65                     | 9.18                     |
| 42              | 3.73                     | 4.48                     | 5.60                     | 6.72                     | 7.47                     | 8.96                     |
| 43              | 3.65                     | 4.38                     | 5.47                     | 6.57                     | 7.30                     | 8.76                     |
| 44              | 3.57                     | 4.28                     | 5.35                     | 6.42                     | 7.13                     | 8.56                     |
| 45              | 3.49                     | 4.18                     | 5.23                     | 6.27                     | 6.97                     | 8.37                     |
| 46              | 3.41                     | 4.09                     | 5.12                     | 6.14                     | 6.82                     | 8.18                     |
| 47              | 3.34                     | 4.01                     | 5.01                     | 6.01                     | 6.68                     | 8.01                     |
| 48              | 3.27                     | 3.92                     | 4.90                     | 5.88                     | 6.54                     | 7.84                     |
| 49              | 3.20                     | 3.84                     | 4.80                     | 5.76                     | 6.40                     | 7.68                     |
| 50              | 3.14                     | 3.76                     | 4.71                     | 5.65                     | 6.27                     | 7.53                     |
| 51              | 3.08                     | 3.69                     | 4.61                     | 5.54                     | 6.15                     | 7.38                     |
| 52              | 3.02                     | 3.62                     | 4.52                     | 5.43                     | 6.03                     | 7.25                     |
| 53              | 2.96                     | 3.55                     | 4.44                     | 5.33                     | 5.92                     | 7.10                     |
| 54              | 2.90                     | 3.49                     | 4.36                     | 5.23                     | 5.81                     | 6.97                     |
| 55              | 2.85                     | 3.42                     | 4.28                     | 5.13                     | 5.70                     | 6.84                     |
| 56              | 2.80                     | 3.36                     | 4.20                     | 5.04                     | 5.60                     | 6.72                     |
| 57              | 2.75                     | 3.30                     | 4.13                     | 4.95                     | 5.50                     | 6.60                     |
| 58              | 2.70                     | 3.25                     | 4.06                     | 4.87                     | 5.41                     | 6.50                     |
| 59              | 2.66                     | 3.19                     | 3.99                     | 4.79                     | 5.32                     | 6.38                     |
| 60              | 2.61                     | 3.14                     | 3.92                     | 4.71                     | 5.23                     | 6.27                     |
| Constants       | 156.86                   | 188.24                   | 235.29                   | 282.35                   | 313.73                   | 376.47                   |



# TWIST GEARING TABLE FOR TWISTING

## TWIST GEARING TABLE—(Continued)

36" AND 39" TWISTERS

**CYLINDER 8 INCHES DIAM. WHIRL 1½ INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 4.95

FRONT ROLL 1½ INCHES DIAM. FRONT ROLL GEAR 112 TEETH

| Change<br>Gears | TWIST PER INCH            |                           |                           |                           |                           |                           |
|-----------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
|                 | Cyl. 30 T.<br>Jack 112 T. | Cyl. 27 T.<br>Jack 112 T. | Cyl. 24 T.<br>Jack 112 T. | Cyl. 24 T.<br>Jack 120 T. | Cyl. 21 T.<br>Jack 120 T. | Cyl. 18 T.<br>Jack 120 T. |
| 16              | 27.45                     | 30.50                     | 34.31                     | 36.77                     | 42.02                     | 49.02                     |
| 17              | 25.84                     | 28.71                     | 32.29                     | 34.60                     | 39.55                     | 46.14                     |
| 18              | 24.40                     | 27.11                     | 30.50                     | 32.68                     | 37.35                     | 43.57                     |
| 19              | 23.12                     | 25.69                     | 28.90                     | 30.96                     | 35.38                     | 41.28                     |
| 20              | 21.96                     | 24.40                     | 27.45                     | 29.41                     | 33.61                     | 39.22                     |
| 21              | 20.92                     | 23.24                     | 26.14                     | 28.01                     | 32.01                     | 37.35                     |
| 22              | 19.96                     | 22.18                     | 24.96                     | 26.74                     | 30.56                     | 35.65                     |
| 23              | 19.10                     | 21.22                     | 23.87                     | 25.58                     | 29.23                     | 34.10                     |
| 24              | 18.30                     | 20.33                     | 22.88                     | 24.51                     | 28.01                     | 32.68                     |
| 25              | 17.57                     | 19.52                     | 21.96                     | 23.53                     | 26.89                     | 31.37                     |
| 26              | 16.89                     | 18.77                     | 21.12                     | 22.62                     | 25.86                     | 30.17                     |
| 27              | 16.27                     | 18.07                     | 20.33                     | 21.79                     | 24.90                     | 29.05                     |
| 28              | 15.69                     | 17.43                     | 19.61                     | 21.01                     | 24.01                     | 28.01                     |
| 29              | 15.15                     | 16.83                     | 18.93                     | 20.28                     | 23.18                     | 27.05                     |
| 30              | 14.64                     | 16.27                     | 18.30                     | 19.61                     | 22.41                     | 26.14                     |
| 31              | 14.17                     | 15.74                     | 17.71                     | 18.98                     | 21.69                     | 25.30                     |
| 32              | 13.73                     | 15.25                     | 17.16                     | 18.38                     | 21.01                     | 24.51                     |
| 33              | 13.31                     | 14.79                     | 16.64                     | 17.83                     | 20.37                     | 23.77                     |
| 34              | 12.92                     | 14.35                     | 16.15                     | 17.30                     | 19.77                     | 23.07                     |
| 35              | 12.55                     | 13.94                     | 15.69                     | 16.81                     | 19.21                     | 22.41                     |
| 36              | 12.20                     | 13.56                     | 15.25                     | 16.34                     | 18.67                     | 21.79                     |
| 37              | 11.87                     | 13.19                     | 14.84                     | 15.90                     | 18.17                     | 21.20                     |
| 38              | 11.56                     | 12.84                     | 14.45                     | 15.48                     | 17.69                     | 20.64                     |
| 39              | 11.26                     | 12.51                     | 14.08                     | 15.08                     | 17.24                     | 20.11                     |
| 40              | 10.98                     | 12.20                     | 13.73                     | 14.71                     | 16.81                     | 19.61                     |
| 41              | 10.71                     | 11.90                     | 13.39                     | 14.35                     | 16.40                     | 19.13                     |
| 42              | 10.46                     | 11.62                     | 13.08                     | 14.01                     | 16.01                     | 18.67                     |
| 43              | 10.21                     | 11.35                     | 12.77                     | 13.68                     | 15.63                     | 18.24                     |
| 44              | 9.98                      | 11.09                     | 12.48                     | 13.37                     | 15.28                     | 17.83                     |
| 45              | 9.76                      | 10.84                     | 12.20                     | 13.07                     | 14.94                     | 17.43                     |
| 46              | 9.55                      | 10.61                     | 11.94                     | 12.79                     | 14.61                     | 17.05                     |
| 47              | 9.35                      | 10.38                     | 11.68                     | 12.52                     | 14.30                     | 16.69                     |
| 48              | 9.15                      | 10.17                     | 11.44                     | 12.26                     | 14.01                     | 16.34                     |
| 49              | 8.96                      | 9.96                      | 11.20                     | 12.00                     | 13.72                     | 16.01                     |
| 50              | 8.78                      | 9.76                      | 10.98                     | 11.76                     | 13.45                     | 15.69                     |
| 51              | 8.61                      | 9.57                      | 10.77                     | 11.53                     | 13.18                     | 15.38                     |
| 52              | 8.45                      | 9.39                      | 10.56                     | 11.31                     | 12.93                     | 15.08                     |
| 53              | 8.29                      | 9.21                      | 10.36                     | 11.10                     | 12.68                     | 14.80                     |
| 54              | 8.13                      | 9.04                      | 10.17                     | 10.89                     | 12.45                     | 14.52                     |
| 55              | 7.99                      | 8.87                      | 9.98                      | 10.70                     | 12.22                     | 14.26                     |
| 56              | 7.84                      | 8.71                      | 9.80                      | 10.50                     | 12.00                     | 14.01                     |
| 57              | 7.71                      | 8.56                      | 9.63                      | 10.32                     | 11.79                     | 13.76                     |
| 58              | 7.57                      | 8.41                      | 9.47                      | 10.14                     | 11.59                     | 13.52                     |
| 59              | 7.44                      | 8.27                      | 9.31                      | 9.97                      | 11.39                     | 13.29                     |
| 60              | 7.32                      | 8.13                      | 9.15                      | 9.80                      | 11.20                     | 13.07                     |
| Constants       | 439.22                    | 488.02                    | 549.02                    | 588.24                    | 672.27                    | 784.31                    |

# TWIST GEARING TABLE FOR TWISTING

## TWIST GEARING TABLE

36" AND 39" TWISTERS

**CYLINDER 8 INCHES DIAM. WHIRL  $1\frac{5}{8}$  INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 4.60

FRONT ROLL  $1\frac{1}{2}$  INCHES DIAM. FRONT ROLL GEAR 112 TEETH

| Change<br><br>Gears | TWIST PER INCH           |                          |                          |                          |                          |                          |
|---------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
|                     | Cyl. 60 T.<br>Jack 80 T. | Cyl. 50 T.<br>Jack 80 T. | Cyl. 40 T.<br>Jack 80 T. | Cyl. 40 T.<br>Jack 96 T. | Cyl. 36 T.<br>Jack 96 T. | Cyl. 30 T.<br>Jack 96 T. |
| 16                  | 9.11                     | 10.93                    | 13.67                    | 16.40                    | 18.22                    | 21.87                    |
| 17                  | 8.57                     | 10.29                    | 12.86                    | 15.43                    | 17.15                    | 20.58                    |
| 18                  | 8.10                     | 9.72                     | 12.15                    | 14.58                    | 16.20                    | 19.44                    |
| 19                  | 7.67                     | 9.21                     | 11.51                    | 13.81                    | 15.34                    | 18.41                    |
| 20                  | 7.29                     | 8.75                     | 10.93                    | 13.12                    | 14.58                    | 17.49                    |
| 21                  | 6.94                     | 8.33                     | 10.41                    | 12.49                    | 13.88                    | 16.66                    |
| 22                  | 6.63                     | 7.95                     | 9.94                     | 11.93                    | 13.25                    | 15.90                    |
| 23                  | 6.34                     | 7.61                     | 9.51                     | 11.41                    | 12.68                    | 15.21                    |
| 24                  | 6.07                     | 7.29                     | 9.11                     | 10.93                    | 12.15                    | 14.58                    |
| 25                  | 5.83                     | 7.00                     | 8.75                     | 10.50                    | 11.66                    | 13.99                    |
| 26                  | 5.61                     | 6.73                     | 8.41                     | 10.09                    | 11.21                    | 13.46                    |
| 27                  | 5.40                     | 6.48                     | 8.10                     | 9.72                     | 10.80                    | 12.96                    |
| 28                  | 5.21                     | 6.25                     | 7.81                     | 9.37                     | 10.41                    | 12.49                    |
| 29                  | 5.03                     | 6.03                     | 7.54                     | 9.05                     | 10.05                    | 12.06                    |
| 30                  | 4.86                     | 5.83                     | 7.29                     | 8.75                     | 9.72                     | 11.66                    |
| 31                  | 4.70                     | 5.64                     | 7.05                     | 8.46                     | 9.40                     | 11.29                    |
| 32                  | 4.56                     | 5.47                     | 6.83                     | 8.20                     | 9.11                     | 10.93                    |
| 33                  | 4.42                     | 5.30                     | 6.63                     | 7.95                     | 8.83                     | 10.60                    |
| 34                  | 4.29                     | 5.15                     | 6.43                     | 7.72                     | 8.57                     | 10.29                    |
| 35                  | 4.16                     | 5.00                     | 6.25                     | 7.50                     | 8.33                     | 10.00                    |
| 36                  | 4.05                     | 4.86                     | 6.07                     | 7.29                     | 8.10                     | 9.72                     |
| 37                  | 3.94                     | 4.73                     | 5.91                     | 7.09                     | 7.88                     | 9.46                     |
| 38                  | 3.84                     | 4.60                     | 5.75                     | 6.91                     | 7.67                     | 9.21                     |
| 39                  | 3.74                     | 4.49                     | 5.61                     | 6.73                     | 7.48                     | 8.97                     |
| 40                  | 3.64                     | 4.37                     | 5.47                     | 6.56                     | 7.29                     | 8.75                     |
| 41                  | 3.56                     | 4.27                     | 5.33                     | 6.40                     | 7.11                     | 8.53                     |
| 42                  | 3.47                     | 4.17                     | 5.21                     | 6.25                     | 6.94                     | 8.33                     |
| 43                  | 3.39                     | 4.07                     | 5.09                     | 6.10                     | 6.78                     | 8.14                     |
| 44                  | 3.31                     | 3.97                     | 4.97                     | 5.96                     | 6.63                     | 7.95                     |
| 45                  | 3.24                     | 3.89                     | 4.86                     | 5.83                     | 6.48                     | 7.77                     |
| 46                  | 3.17                     | 3.80                     | 4.75                     | 5.70                     | 6.34                     | 7.61                     |
| 47                  | 3.10                     | 3.72                     | 4.65                     | 5.58                     | 6.20                     | 7.44                     |
| 48                  | 3.04                     | 3.64                     | 4.56                     | 5.47                     | 6.07                     | 7.29                     |
| 49                  | 2.97                     | 3.57                     | 4.46                     | 5.35                     | 5.95                     | 7.14                     |
| 50                  | 2.92                     | 3.50                     | 4.37                     | 5.25                     | 5.83                     | 7.00                     |
| 51                  | 2.86                     | 3.44                     | 4.29                     | 5.14                     | 5.72                     | 6.86                     |
| 52                  | 2.80                     | 3.36                     | 4.21                     | 5.05                     | 5.61                     | 6.73                     |
| 53                  | 2.75                     | 3.30                     | 4.13                     | 4.95                     | 5.50                     | 6.60                     |
| 54                  | 2.70                     | 3.24                     | 4.05                     | 4.86                     | 5.40                     | 6.48                     |
| 55                  | 2.65                     | 3.18                     | 3.98                     | 4.77                     | 5.30                     | 6.36                     |
| 56                  | 2.60                     | 3.12                     | 3.90                     | 4.69                     | 5.21                     | 6.25                     |
| 57                  | 2.56                     | 3.07                     | 3.84                     | 4.60                     | 5.11                     | 6.14                     |
| 58                  | 2.51                     | 3.01                     | 3.77                     | 4.52                     | 5.03                     | 6.03                     |
| 59                  | 2.47                     | 2.97                     | 3.71                     | 4.45                     | 4.94                     | 5.93                     |
| 60                  | 2.43                     | 2.92                     | 3.64                     | 4.37                     | 4.86                     | 5.83                     |
| Constants           | 145.77                   | 174.93                   | 218.66                   | 262.39                   | 291.54                   | 349.85                   |

# TWIST GEARING TABLE —(Continued)

36" AND 39" TWISTERS

**CYLINDER 8 INCHES DIAM. WHIRL  $1\frac{5}{8}$  INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 4.60

**FRONT ROLL  $1\frac{1}{2}$  INCHES DIAM. FRONT ROLL GEAR 112 TEETH**

| Change<br><br>Gears | TWIST PER INCH |             |             |             |             |             |
|---------------------|----------------|-------------|-------------|-------------|-------------|-------------|
|                     | Cyl. 30 T.     | Cyl. 27 T.  | Cyl. 24 T.  | Cyl. 24 T.  | Cyl. 21 T.  | Cyl. 18 T.  |
|                     | Jack 112 T.    | Jack 112 T. | Jack 112 T. | Jack 120 T. | Jack 120 T. | Jack 120 T. |
| 16                  | 25.51          | 28.34       | 31.89       | 34.17       | 39.05       | 45.55       |
| 17                  | 24.01          | 26.68       | 30.01       | 32.16       | 36.75       | 42.87       |
| 18                  | 22.68          | 25.20       | 28.34       | 30.37       | 34.71       | 40.49       |
| 19                  | 21.48          | 23.87       | 26.85       | 28.77       | 32.88       | 38.36       |
| 20                  | 20.41          | 22.68       | 25.51       | 27.33       | 31.24       | 36.44       |
| 21                  | 19.44          | 21.60       | 24.30       | 26.03       | 29.75       | 34.71       |
| 22                  | 18.55          | 20.61       | 23.19       | 24.85       | 28.40       | 33.13       |
| 23                  | 17.75          | 19.72       | 22.18       | 23.77       | 27.16       | 31.69       |
| 24                  | 17.01          | 18.90       | 21.26       | 22.78       | 26.03       | 30.37       |
| 25                  | 16.33          | 18.14       | 20.41       | 21.87       | 24.99       | 29.15       |
| 26                  | 15.70          | 17.44       | 19.62       | 21.02       | 24.03       | 28.03       |
| 27                  | 15.12          | 16.80       | 18.90       | 20.25       | 23.14       | 26.99       |
| 28                  | 14.58          | 16.20       | 18.22       | 19.52       | 22.31       | 26.03       |
| 29                  | 14.07          | 15.64       | 17.59       | 18.85       | 21.54       | 25.13       |
| 30                  | 13.61          | 15.12       | 17.01       | 18.22       | 20.82       | 24.30       |
| 31                  | 13.17          | 14.63       | 16.46       | 17.63       | 20.15       | 23.51       |
| 32                  | 12.76          | 14.17       | 15.94       | 17.08       | 19.52       | 22.78       |
| 33                  | 12.37          | 13.74       | 15.46       | 16.56       | 18.93       | 22.09       |
| 34                  | 12.01          | 13.34       | 15.01       | 16.08       | 18.37       | 21.44       |
| 35                  | 11.66          | 12.96       | 14.58       | 15.62       | 17.85       | 20.82       |
| 36                  | 11.34          | 12.60       | 14.17       | 15.18       | 17.35       | 20.25       |
| 37                  | 11.03          | 12.26       | 13.79       | 14.77       | 16.88       | 19.70       |
| 38                  | 10.74          | 11.93       | 13.43       | 14.39       | 16.44       | 19.18       |
| 39                  | 10.47          | 11.63       | 13.08       | 14.02       | 16.02       | 18.69       |
| 40                  | 10.20          | 11.34       | 12.76       | 13.67       | 15.62       | 18.22       |
| 41                  | 9.96           | 11.06       | 12.44       | 13.33       | 15.24       | 17.78       |
| 42                  | 9.72           | 10.80       | 12.15       | 13.02       | 14.87       | 17.35       |
| 43                  | 9.49           | 10.55       | 11.87       | 12.71       | 14.53       | 16.95       |
| 44                  | 9.28           | 10.31       | 11.60       | 12.42       | 14.20       | 16.57       |
| 45                  | 9.07           | 10.08       | 11.34       | 12.15       | 13.88       | 16.20       |
| 46                  | 8.87           | 9.86        | 11.09       | 11.88       | 13.58       | 15.84       |
| 47                  | 8.68           | 9.65        | 10.86       | 11.63       | 13.29       | 15.51       |
| 48                  | 8.50           | 9.45        | 10.63       | 11.39       | 13.02       | 15.19       |
| 49                  | 8.33           | 9.26        | 10.41       | 11.16       | 12.75       | 14.87       |
| 50                  | 8.16           | 9.07        | 10.20       | 10.93       | 12.49       | 14.58       |
| 51                  | 8.00           | 8.89        | 10.00       | 10.72       | 12.25       | 14.29       |
| 52                  | 7.85           | 8.72        | 9.81        | 10.51       | 12.01       | 14.02       |
| 53                  | 7.70           | 8.56        | 9.63        | 10.31       | 11.79       | 13.75       |
| 54                  | 7.56           | 8.40        | 9.45        | 10.12       | 11.57       | 13.50       |
| 55                  | 7.42           | 8.25        | 9.28        | 9.94        | 11.36       | 13.25       |
| 56                  | 7.29           | 8.10        | 9.11        | 9.76        | 11.16       | 13.02       |
| 57                  | 7.16           | 7.96        | 8.95        | 9.59        | 10.96       | 12.79       |
| 58                  | 7.04           | 7.82        | 8.80        | 9.43        | 10.77       | 12.57       |
| 59                  | 6.92           | 7.69        | 8.65        | 9.27        | 10.59       | 12.36       |
| 60                  | 6.80           | 7.56        | 8.50        | 9.11        | 10.41       | 12.15       |
| Constants           | 408.16         | 453.51      | 510.20      | 546.64      | 624.73      | 728.86      |

# TWIST GEARING TABLE FOR TWISTING

## TWIST GEARING TABLE

36" AND 39" TWISTERS

**CYLINDER 8 INCHES DIAM. WHIRL  $1\frac{3}{4}$  INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 4.29

FRONT ROLL  $1\frac{1}{2}$  INCHES DIAM. FRONT ROLL GEAR 112 TEETH

| Change<br>Gears | TWIST PER INCH |            |            |            |            |            |
|-----------------|----------------|------------|------------|------------|------------|------------|
|                 | Cyl. 60 T.     | Cyl. 50 T. | Cyl. 40 T. | Cyl. 40 T. | Cyl. 36 T. | Cyl. 30 T. |
|                 | Jack 80 T.     | Jack 80 T. | Jack 80 T. | Jack 96 T. | Jack 96 T. | Jack 96 T. |
| 16              | 8.50           | 10.20      | 12.75      | 15.29      | 16.99      | 20.39      |
| 17              | 8.00           | 9.60       | 12.00      | 14.39      | 15.99      | 19.19      |
| 18              | 7.55           | 9.06       | 11.33      | 13.60      | 15.11      | 18.13      |
| 19              | 7.16           | 8.59       | 10.73      | 12.88      | 14.31      | 17.17      |
| 20              | 6.80           | 8.16       | 10.20      | 12.24      | 13.60      | 16.31      |
| 21              | 6.47           | 7.77       | 9.71       | 11.65      | 12.95      | 15.54      |
| 22              | 6.18           | 7.42       | 9.27       | 11.12      | 12.36      | 14.83      |
| 23              | 5.91           | 7.09       | 8.87       | 10.64      | 11.82      | 14.19      |
| 24              | 5.66           | 6.80       | 8.50       | 10.20      | 11.33      | 13.59      |
| 25              | 5.44           | 6.53       | 8.16       | 9.79       | 10.88      | 13.05      |
| 26              | 5.23           | 6.27       | 7.84       | 9.41       | 10.46      | 12.55      |
| 27              | 5.04           | 6.04       | 7.55       | 9.06       | 10.07      | 12.08      |
| 28              | 4.86           | 5.83       | 7.28       | 8.74       | 9.71       | 11.65      |
| 29              | 4.69           | 5.63       | 7.03       | 8.44       | 9.38       | 11.25      |
| 30              | 4.53           | 5.44       | 6.80       | 8.16       | 9.06       | 10.88      |
| 31              | 4.39           | 5.26       | 6.58       | 7.89       | 8.77       | 10.52      |
| 32              | 4.25           | 5.10       | 6.37       | 7.65       | 8.50       | 10.20      |
| 33              | 4.12           | 4.94       | 6.18       | 7.42       | 8.24       | 9.89       |
| 34              | 4.00           | 4.80       | 6.00       | 7.20       | 8.00       | 9.60       |
| 35              | 3.88           | 4.66       | 5.83       | 6.99       | 7.77       | 9.32       |
| 36              | 3.78           | 4.53       | 5.66       | 6.80       | 7.55       | 9.06       |
| 37              | 3.67           | 4.41       | 5.51       | 6.61       | 7.35       | 8.82       |
| 38              | 3.58           | 4.29       | 5.37       | 6.44       | 7.16       | 8.59       |
| 39              | 3.49           | 4.18       | 5.23       | 6.27       | 6.97       | 8.37       |
| 40              | 3.40           | 4.08       | 5.10       | 6.12       | 6.80       | 8.16       |
| 41              | 3.32           | 3.98       | 4.97       | 5.97       | 6.63       | 7.96       |
| 42              | 3.24           | 3.88       | 4.86       | 5.83       | 6.47       | 7.77       |
| 43              | 3.16           | 3.79       | 4.74       | 5.69       | 6.32       | 7.59       |
| 44              | 3.09           | 3.71       | 4.63       | 5.56       | 6.18       | 7.42       |
| 45              | 3.02           | 3.63       | 4.53       | 5.44       | 6.04       | 7.25       |
| 46              | 2.96           | 3.55       | 4.43       | 5.32       | 5.91       | 7.09       |
| 47              | 2.89           | 3.47       | 4.34       | 5.21       | 5.79       | 6.94       |
| 48              | 2.83           | 3.40       | 4.25       | 5.10       | 5.66       | 6.80       |
| 49              | 2.77           | 3.33       | 4.16       | 4.99       | 5.55       | 6.66       |
| 50              | 2.72           | 3.26       | 4.08       | 4.89       | 5.44       | 6.53       |
| 51              | 2.67           | 3.20       | 4.00       | 4.80       | 5.33       | 6.40       |
| 52              | 2.61           | 3.14       | 3.92       | 4.71       | 5.23       | 6.27       |
| 53              | 2.57           | 3.08       | 3.85       | 4.62       | 5.13       | 6.16       |
| 54              | 2.52           | 3.02       | 3.78       | 4.53       | 5.04       | 6.04       |
| 55              | 2.47           | 2.97       | 3.71       | 4.45       | 4.94       | 5.93       |
| 56              | 2.43           | 2.91       | 3.64       | 4.37       | 4.86       | 5.83       |
| 57              | 2.39           | 2.86       | 3.58       | 4.29       | 4.77       | 5.72       |
| 58              | 2.34           | 2.81       | 3.52       | 4.22       | 4.69       | 5.63       |
| 59              | 2.30           | 2.77       | 3.46       | 4.15       | 4.61       | 5.53       |
| 60              | 2.27           | 2.72       | 3.40       | 4.08       | 4.53       | 5.44       |
| Constants       | 135.95         | 163.14     | 203.92     | 244.71     | 271.90     | 326.27     |

# TWIST GEARING TABLE FOR TWISTING

## TWIST GEARING TABLE—(Continued)

36" AND 39" TWISTERS

CYLINDER 8 INCHES DIAM. WHIRL  $1\frac{3}{4}$  INCHES DIAM.

RATIO OF CYLINDER TO WHIRL 1 TO 4.29

FRONT ROLL  $1\frac{1}{2}$  INCHES DIAM. FRONT ROLL GEAR 112 TEETH

| Change<br><br>Gears | TWIST PER INCH            |                           |                           |                           |                           |                           |
|---------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
|                     | Cyl. 30 T.<br>Jack 112 T. | Cyl. 27 T.<br>Jack 112 T. | Cyl. 24 T.<br>Jack 112 T. | Cyl. 24 T.<br>Jack 120 T. | Cyl. 21 T.<br>Jack 120 T. | Cyl. 18 T.<br>Jack 120 T. |
| 16                  | 23.79                     | 26.43                     | 29.74                     | 31.86                     | 36.41                     | 42.48                     |
| 17                  | 22.39                     | 24.88                     | 27.99                     | 29.99                     | 34.27                     | 39.98                     |
| 18                  | 21.15                     | 23.50                     | 26.43                     | 28.32                     | 32.37                     | 37.76                     |
| 19                  | 20.03                     | 22.26                     | 25.04                     | 26.83                     | 30.66                     | 35.78                     |
| 20                  | 19.03                     | 21.15                     | 23.79                     | 25.49                     | 29.13                     | 33.99                     |
| 21                  | 18.13                     | 20.14                     | 22.66                     | 24.28                     | 27.74                     | 32.37                     |
| 22                  | 17.30                     | 19.23                     | 21.63                     | 23.17                     | 26.48                     | 30.90                     |
| 23                  | 16.55                     | 18.39                     | 20.69                     | 22.17                     | 25.33                     | 29.55                     |
| 24                  | 15.86                     | 17.62                     | 19.83                     | 21.24                     | 24.28                     | 28.32                     |
| 25                  | 15.23                     | 16.92                     | 19.03                     | 20.39                     | 23.31                     | 27.19                     |
| 26                  | 14.64                     | 16.27                     | 18.30                     | 19.61                     | 22.41                     | 26.14                     |
| 27                  | 14.10                     | 15.66                     | 17.62                     | 18.88                     | 21.58                     | 25.18                     |
| 28                  | 13.59                     | 15.11                     | 16.99                     | 18.21                     | 20.81                     | 24.28                     |
| 29                  | 13.13                     | 14.58                     | 16.41                     | 17.58                     | 20.09                     | 23.44                     |
| 30                  | 12.69                     | 14.10                     | 15.86                     | 16.99                     | 19.42                     | 22.66                     |
| 31                  | 12.28                     | 13.64                     | 15.35                     | 16.45                     | 18.79                     | 21.93                     |
| 32                  | 11.90                     | 13.22                     | 14.87                     | 15.93                     | 18.21                     | 21.24                     |
| 33                  | 11.53                     | 12.82                     | 14.42                     | 15.45                     | 17.66                     | 20.60                     |
| 34                  | 11.20                     | 12.44                     | 13.99                     | 14.99                     | 17.14                     | 19.99                     |
| 35                  | 10.88                     | 12.08                     | 13.59                     | 14.57                     | 16.65                     | 19.42                     |
| 36                  | 10.57                     | 11.75                     | 13.22                     | 14.16                     | 16.18                     | 18.88                     |
| 37                  | 10.29                     | 11.43                     | 12.86                     | 13.78                     | 15.75                     | 18.37                     |
| 38                  | 10.02                     | 11.13                     | 12.52                     | 13.42                     | 15.33                     | 17.89                     |
| 39                  | 9.76                      | 10.84                     | 12.20                     | 13.07                     | 14.94                     | 17.43                     |
| 40                  | 9.52                      | 10.57                     | 11.90                     | 12.75                     | 14.57                     | 16.99                     |
| 41                  | 9.28                      | 10.32                     | 11.61                     | 12.43                     | 14.21                     | 16.58                     |
| 42                  | 9.06                      | 10.07                     | 11.33                     | 12.14                     | 13.87                     | 16.18                     |
| 43                  | 8.85                      | 9.84                      | 11.07                     | 11.86                     | 13.55                     | 15.81                     |
| 44                  | 8.65                      | 9.61                      | 10.81                     | 11.59                     | 13.24                     | 15.45                     |
| 45                  | 8.46                      | 9.40                      | 10.57                     | 11.33                     | 12.95                     | 15.11                     |
| 46                  | 8.28                      | 9.19                      | 10.35                     | 11.08                     | 12.67                     | 14.78                     |
| 47                  | 8.10                      | 9.00                      | 10.12                     | 10.85                     | 12.40                     | 14.46                     |
| 48                  | 7.93                      | 8.81                      | 9.92                      | 10.62                     | 12.14                     | 14.16                     |
| 49                  | 7.77                      | 8.63                      | 9.71                      | 10.40                     | 11.89                     | 13.87                     |
| 50                  | 7.61                      | 8.46                      | 9.52                      | 10.20                     | 11.65                     | 13.59                     |
| 51                  | 7.46                      | 8.29                      | 9.33                      | 10.00                     | 11.42                     | 13.33                     |
| 52                  | 7.32                      | 8.13                      | 9.15                      | 9.80                      | 11.20                     | 13.07                     |
| 53                  | 7.18                      | 7.98                      | 8.98                      | 9.62                      | 10.99                     | 12.83                     |
| 54                  | 7.05                      | 7.83                      | 8.81                      | 9.44                      | 10.79                     | 12.59                     |
| 55                  | 6.92                      | 7.69                      | 8.65                      | 9.27                      | 10.59                     | 12.36                     |
| 56                  | 6.80                      | 7.56                      | 8.50                      | 9.10                      | 10.40                     | 12.14                     |
| 57                  | 6.68                      | 7.42                      | 8.35                      | 8.94                      | 10.22                     | 11.93                     |
| 58                  | 6.56                      | 7.29                      | 8.21                      | 8.79                      | 10.05                     | 11.72                     |
| 59                  | 6.45                      | 7.17                      | 8.06                      | 8.64                      | 9.88                      | 11.52                     |
| 60                  | 6.34                      | 7.05                      | 7.93                      | 8.50                      | 9.71                      | 11.33                     |
| Constants           | 380.65                    | 422.95                    | 475.82                    | 509.80                    | 582.63                    | 679.74                    |

# TWIST GEARING TABLE

42" TWISTERS

CYLINDER 7 INCHES DIAM. WHIRL 1½ INCHES DIAM.

RATIO OF CYLINDER TO WHIRL 1 TO 4.35

FRONT ROLL 1½ INCHES DIAM. FRONT ROLL GEAR 112 TEETH

| Change<br><br>Gears | TWIST PER INCH |            |            |             |             |             |
|---------------------|----------------|------------|------------|-------------|-------------|-------------|
|                     | Cyl. 70 T.     | Cyl. 60 T. | Cyl. 50 T. | Cyl. 50 T.  | Cyl. 45 T.  | Cyl. 40 T.  |
|                     | Jack 96 T.     | Jack 96 T. | Jack 96 T. | Jack 112 T. | Jack 112 T. | Jack 112 T. |
| 16                  | 8.86           | 10.34      | 12.41      | 14.47       | 16.08       | 18.09       |
| 17                  | 8.34           | 9.73       | 11.68      | 13.62       | 15.14       | 17.03       |
| 18                  | 7.88           | 9.19       | 11.03      | 12.87       | 14.30       | 16.08       |
| 19                  | 7.46           | 8.71       | 10.45      | 12.19       | 13.54       | 15.24       |
| 20                  | 7.09           | 8.27       | 9.93       | 11.58       | 12.87       | 14.47       |
| 21                  | 6.75           | 7.88       | 9.45       | 11.03       | 12.25       | 13.78       |
| 22                  | 6.45           | 7.52       | 9.02       | 10.53       | 11.70       | 13.16       |
| 23                  | 6.16           | 7.19       | 8.63       | 10.07       | 11.19       | 12.59       |
| 24                  | 5.91           | 6.89       | 8.27       | 9.65        | 10.72       | 12.06       |
| 25                  | 5.67           | 6.62       | 7.94       | 9.26        | 10.29       | 11.58       |
| 26                  | 5.45           | 6.36       | 7.63       | 8.91        | 9.90        | 11.13       |
| 27                  | 5.25           | 6.13       | 7.35       | 8.58        | 9.53        | 10.72       |
| 28                  | 5.06           | 5.91       | 7.09       | 8.27        | 9.19        | 10.34       |
| 29                  | 4.89           | 5.70       | 6.84       | 7.99        | 8.87        | 9.98        |
| 30                  | 4.73           | 5.51       | 6.62       | 7.72        | 8.58        | 9.65        |
| 31                  | 4.57           | 5.34       | 6.40       | 7.47        | 8.30        | 9.34        |
| 32                  | 4.43           | 5.17       | 6.20       | 7.24        | 8.04        | 9.05        |
| 33                  | 4.30           | 5.01       | 6.02       | 7.02        | 7.80        | 8.77        |
| 34                  | 4.17           | 4.87       | 5.84       | 6.81        | 7.57        | 8.51        |
| 35                  | 4.05           | 4.73       | 5.67       | 6.62        | 7.35        | 8.27        |
| 36                  | 3.94           | 4.60       | 5.52       | 6.43        | 7.15        | 8.04        |
| 37                  | 3.83           | 4.47       | 5.36       | 6.26        | 6.95        | 7.82        |
| 38                  | 3.73           | 4.36       | 5.23       | 6.10        | 6.77        | 7.62        |
| 39                  | 3.64           | 4.24       | 5.09       | 5.94        | 6.60        | 7.42        |
| 40                  | 3.54           | 4.14       | 4.96       | 5.79        | 6.43        | 7.24        |
| 41                  | 3.46           | 4.03       | 4.84       | 5.65        | 6.28        | 7.06        |
| 42                  | 3.38           | 3.94       | 4.73       | 5.52        | 6.13        | 6.89        |
| 43                  | 3.30           | 3.85       | 4.62       | 5.39        | 5.98        | 6.73        |
| 44                  | 3.22           | 3.76       | 4.51       | 5.26        | 5.85        | 6.58        |
| 45                  | 3.15           | 3.68       | 4.41       | 5.15        | 5.72        | 6.43        |
| 46                  | 3.08           | 3.60       | 4.32       | 5.04        | 5.59        | 6.30        |
| 47                  | 3.02           | 3.52       | 4.22       | 4.93        | 5.47        | 6.16        |
| 48                  | 2.95           | 3.45       | 4.14       | 4.83        | 5.36        | 6.03        |
| 49                  | 2.89           | 3.38       | 4.05       | 4.73        | 5.25        | 5.91        |
| 50                  | 2.84           | 3.31       | 3.97       | 4.63        | 5.15        | 5.79        |
| 51                  | 2.78           | 3.24       | 3.89       | 4.54        | 5.05        | 5.68        |
| 52                  | 2.73           | 3.18       | 3.82       | 4.46        | 4.95        | 5.57        |
| 53                  | 2.68           | 3.12       | 3.75       | 4.37        | 4.86        | 5.46        |
| 54                  | 2.63           | 3.06       | 3.68       | 4.29        | 4.77        | 5.36        |
| 55                  | 2.58           | 3.01       | 3.61       | 4.21        | 4.68        | 5.26        |
| 56                  | 2.53           | 2.96       | 3.55       | 4.14        | 4.60        | 5.17        |
| 57                  | 2.49           | 2.90       | 3.48       | 4.06        | 4.51        | 5.08        |
| 58                  | 2.44           | 2.85       | 3.42       | 4.00        | 4.44        | 4.99        |
| 59                  | 2.40           | 2.80       | 3.36       | 3.92        | 4.36        | 4.91        |
| 60                  | 2.36           | 2.76       | 3.31       | 3.86        | 4.29        | 4.82        |
| Constants           | 141.79         | 165.42     | 198.50     | 231.59      | 257.32      | 289.48      |



**TWIST GEARING TABLE**—(Continued)

42" TWISTERS

**CYLINDER 7 INCHES DIAM. WHIRL  $1\frac{1}{2}$  INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 4.35

**FRONT ROLL  $1\frac{1}{2}$  INCHES DIAM. FRONT ROLL GEAR 112 TEETH**

| Change<br><br>Gears | TWIST PER INCH |             |             |             |             |             |
|---------------------|----------------|-------------|-------------|-------------|-------------|-------------|
|                     | Cyl. 40 T.     | Cyl. 36 T.  | Cyl. 30 T.  | Cyl. 30 T.  | Cyl. 27 T.  | Cyl. 24 T.  |
|                     | Jack 120 T.    | Jack 120 T. | Jack 120 T. | Jack 132 T. | Jack 132 T. | Jack 132 T. |
| 16                  | 19.39          | 21.54       | 25.85       | 28.43       | 31.59       | 35.54       |
| 17                  | 18.24          | 20.27       | 24.33       | 26.76       | 29.73       | 33.45       |
| 18                  | 17.23          | 19.15       | 22.98       | 25.27       | 28.08       | 31.59       |
| 19                  | 16.32          | 18.14       | 21.77       | 23.94       | 26.60       | 29.93       |
| 20                  | 15.51          | 17.23       | 20.68       | 22.75       | 25.27       | 28.43       |
| 21                  | 14.77          | 16.41       | 19.69       | 21.66       | 24.07       | 27.08       |
| 22                  | 14.10          | 15.66       | 18.80       | 20.68       | 22.98       | 25.85       |
| 23                  | 13.49          | 14.98       | 17.98       | 19.78       | 21.98       | 24.72       |
| 24                  | 12.92          | 14.36       | 17.23       | 18.95       | 21.06       | 23.69       |
| 25                  | 12.41          | 13.78       | 16.54       | 18.20       | 20.22       | 22.74       |
| 26                  | 11.93          | 13.25       | 15.91       | 17.50       | 19.44       | 21.87       |
| 27                  | 11.49          | 12.76       | 15.32       | 16.85       | 18.72       | 21.06       |
| 28                  | 11.08          | 12.31       | 14.77       | 16.25       | 18.05       | 20.31       |
| 29                  | 10.70          | 11.88       | 14.26       | 15.69       | 17.43       | 19.61       |
| 30                  | 10.34          | 11.49       | 13.79       | 15.16       | 16.85       | 18.95       |
| 31                  | 10.01          | 11.12       | 13.34       | 14.67       | 16.30       | 18.34       |
| 32                  | 9.69           | 10.77       | 12.92       | 14.22       | 15.80       | 17.77       |
| 33                  | 9.40           | 10.44       | 12.53       | 13.78       | 15.32       | 17.23       |
| 34                  | 9.12           | 10.14       | 12.16       | 13.38       | 14.87       | 16.72       |
| 35                  | 8.86           | 9.85        | 11.82       | 13.00       | 14.44       | 16.25       |
| 36                  | 8.62           | 9.58        | 11.49       | 12.64       | 14.04       | 15.80       |
| 37                  | 8.38           | 9.31        | 11.18       | 12.29       | 13.66       | 15.37       |
| 38                  | 8.16           | 9.07        | 10.89       | 11.97       | 13.30       | 14.97       |
| 39                  | 7.95           | 8.84        | 10.60       | 11.66       | 12.96       | 14.58       |
| 40                  | 7.75           | 8.62        | 10.34       | 11.37       | 12.64       | 14.22       |
| 41                  | 7.56           | 8.41        | 10.09       | 11.10       | 12.33       | 13.87       |
| 42                  | 7.38           | 8.21        | 9.85        | 10.83       | 12.04       | 13.54       |
| 43                  | 7.21           | 8.01        | 9.62        | 10.58       | 11.75       | 13.22       |
| 44                  | 7.05           | 7.83        | 9.40        | 10.34       | 11.49       | 12.92       |
| 45                  | 6.89           | 7.66        | 9.19        | 10.11       | 11.23       | 12.64       |
| 46                  | 6.74           | 7.49        | 8.99        | 9.89        | 10.99       | 12.36       |
| 47                  | 6.60           | 7.33        | 8.80        | 9.68        | 10.75       | 12.10       |
| 48                  | 6.46           | 7.18        | 8.62        | 9.48        | 10.53       | 11.85       |
| 49                  | 6.33           | 7.03        | 8.44        | 9.28        | 10.32       | 11.60       |
| 50                  | 6.20           | 6.89        | 8.27        | 9.10        | 10.11       | 11.37       |
| 51                  | 6.08           | 6.76        | 8.11        | 8.92        | 9.91        | 11.15       |
| 52                  | 5.96           | 6.63        | 7.96        | 8.75        | 9.72        | 10.94       |
| 53                  | 5.85           | 6.50        | 7.80        | 8.58        | 9.54        | 10.73       |
| 54                  | 5.74           | 6.38        | 7.66        | 8.42        | 9.36        | 10.53       |
| 55                  | 5.64           | 6.27        | 7.52        | 8.27        | 9.19        | 10.34       |
| 56                  | 5.54           | 6.16        | 7.39        | 8.13        | 9.03        | 10.16       |
| 57                  | 5.44           | 6.05        | 7.26        | 7.98        | 8.87        | 9.98        |
| 58                  | 5.35           | 5.94        | 7.13        | 7.85        | 8.72        | 9.81        |
| 59                  | 5.26           | 5.84        | 7.01        | 7.71        | 8.57        | 9.65        |
| 60                  | 5.17           | 5.74        | 6.89        | 7.58        | 8.42        | 9.48        |
| Constants           | 310.16         | 344.62      | 413.55      | 454.90      | 505.45      | 568.63      |

# TWIST GEARING TABLE

42" TWISTERS

**CYLINDER 7 INCHES DIAM. WHIRL 1 $\frac{5}{8}$  INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 4.04

**FRONT ROLL 1 $\frac{1}{2}$  INCHES DIAM. FRONT ROLL GEAR 112 TEETH**

| Change<br><br>Gears | TWIST PER INCH |            |            |             |             |             |
|---------------------|----------------|------------|------------|-------------|-------------|-------------|
|                     | Cyl. 70 T.     | Cyl. 60 T. | Cyl. 50 T. | Cyl. 50 T.  | Cyl. 45 T.  | Cyl. 40 T.  |
|                     | Jack 96 T.     | Jack 96 T. | Jack 96 T. | Jack 112 T. | Jack 112 T. | Jack 112 T. |
| 16                  | 8.23           | 9.60       | 11.52      | 13.44       | 14.94       | 16.80       |
| 17                  | 7.75           | 9.04       | 10.84      | 12.65       | 14.06       | 15.81       |
| 18                  | 7.32           | 8.54       | 10.24      | 11.95       | 13.28       | 14.94       |
| 19                  | 6.93           | 8.09       | 9.70       | 11.32       | 12.58       | 14.15       |
| 20                  | 6.58           | 7.68       | 9.22       | 10.75       | 11.95       | 13.44       |
| 21                  | 6.27           | 7.32       | 8.78       | 10.24       | 11.38       | 12.80       |
| 22                  | 5.99           | 6.98       | 8.38       | 9.78        | 10.86       | 12.22       |
| 23                  | 5.73           | 6.68       | 8.02       | 9.35        | 10.39       | 11.69       |
| 24                  | 5.49           | 6.40       | 7.68       | 8.96        | 9.96        | 11.20       |
| 25                  | 5.27           | 6.15       | 7.37       | 8.60        | 9.56        | 10.75       |
| 26                  | 5.06           | 5.91       | 7.09       | 8.27        | 9.19        | 10.34       |
| 27                  | 4.88           | 5.69       | 6.83       | 7.97        | 8.85        | 9.96        |
| 28                  | 4.70           | 5.49       | 6.58       | 7.68        | 8.54        | 9.60        |
| 29                  | 4.54           | 5.30       | 6.36       | 7.42        | 8.24        | 9.27        |
| 30                  | 4.39           | 5.12       | 6.15       | 7.17        | 7.97        | 8.96        |
| 31                  | 4.25           | 4.96       | 5.95       | 6.94        | 7.71        | 8.67        |
| 32                  | 4.12           | 4.80       | 5.76       | 6.72        | 7.47        | 8.40        |
| 33                  | 3.99           | 4.66       | 5.59       | 6.52        | 7.24        | 8.15        |
| 34                  | 3.87           | 4.52       | 5.42       | 6.33        | 7.03        | 7.91        |
| 35                  | 3.76           | 4.39       | 5.27       | 6.15        | 6.83        | 7.68        |
| 36                  | 3.66           | 4.27       | 5.12       | 5.98        | 6.64        | 7.47        |
| 37                  | 3.56           | 4.15       | 4.98       | 5.81        | 6.46        | 7.27        |
| 38                  | 3.47           | 4.05       | 4.85       | 5.66        | 6.29        | 7.08        |
| 39                  | 3.38           | 3.94       | 4.73       | 5.51        | 6.13        | 6.89        |
| 40                  | 3.29           | 3.84       | 4.61       | 5.38        | 5.97        | 6.72        |
| 41                  | 3.21           | 3.75       | 4.50       | 5.25        | 5.83        | 6.56        |
| 42                  | 3.14           | 3.66       | 4.39       | 5.12        | 5.69        | 6.40        |
| 43                  | 3.06           | 3.57       | 4.29       | 5.00        | 5.56        | 6.25        |
| 44                  | 2.99           | 3.49       | 4.19       | 4.89        | 5.43        | 6.11        |
| 45                  | 2.93           | 3.41       | 4.10       | 4.78        | 5.31        | 5.97        |
| 46                  | 2.86           | 3.34       | 4.01       | 4.68        | 5.20        | 5.85        |
| 47                  | 2.80           | 3.27       | 3.92       | 4.58        | 5.08        | 5.72        |
| 48                  | 2.74           | 3.20       | 3.84       | 4.48        | 4.98        | 5.60        |
| 49                  | 2.69           | 3.14       | 3.76       | 4.39        | 4.88        | 5.49        |
| 50                  | 2.63           | 3.07       | 3.69       | 4.30        | 4.78        | 5.38        |
| 51                  | 2.58           | 3.01       | 3.62       | 4.22        | 4.69        | 5.27        |
| 52                  | 2.53           | 2.96       | 3.55       | 4.14        | 4.60        | 5.17        |
| 53                  | 2.48           | 2.90       | 3.48       | 4.06        | 4.51        | 5.07        |
| 54                  | 2.44           | 2.85       | 3.41       | 3.98        | 4.43        | 4.98        |
| 55                  | 2.39           | 2.79       | 3.35       | 3.91        | 4.35        | 4.89        |
| 56                  | 2.35           | 2.75       | 3.29       | 3.84        | 4.27        | 4.80        |
| 57                  | 2.31           | 2.70       | 3.23       | 3.77        | 4.19        | 4.72        |
| 58                  | 2.27           | 2.65       | 3.18       | 3.71        | 4.12        | 4.64        |
| 59                  | 2.23           | 2.60       | 3.12       | 3.65        | 4.05        | 4.56        |
| 60                  | 2.19           | 2.56       | 3.07       | 3.58        | 3.98        | 4.48        |
| Constants           | 131.68         | 153.63     | 184.36     | 215.08      | 238.98      | 268.85      |

# TWIST GEARING TABLE —(Continued)

42" TWISTERS

**CYLINDER 7 INCHES DIAM. WHIRL  $1\frac{5}{8}$  INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 4.04

**FRONT ROLL  $1\frac{1}{2}$  INCHES DIAM. FRONT ROLL GEAR 112 TEETH**

| Change<br><br>Gears | TWIST PER INCH |             |             |             |             |             |
|---------------------|----------------|-------------|-------------|-------------|-------------|-------------|
|                     | Cyl. 40 T.     | Cyl. 36 T.  | Cyl. 30 T.  | Cyl. 30 T.  | Cyl. 27 T.  | Cyl. 24 T.  |
|                     | Jack 120 T.    | Jack 120 T. | Jack 120 T. | Jack 132 T. | Jack 132 T. | Jack 132 T. |
| 16                  | 18.00          | 20.00       | 24.01       | 26.41       | 29.34       | 33.01       |
| 17                  | 16.94          | 18.83       | 22.59       | 24.85       | 27.61       | 31.06       |
| 18                  | 16.00          | 17.78       | 21.34       | 23.47       | 26.08       | 29.34       |
| 19                  | 15.16          | 16.85       | 20.21       | 22.24       | 24.71       | 27.79       |
| 20                  | 14.40          | 16.00       | 19.20       | 21.12       | 23.47       | 26.41       |
| 21                  | 13.72          | 15.24       | 18.29       | 20.12       | 22.35       | 25.15       |
| 22                  | 13.09          | 14.55       | 17.46       | 19.20       | 21.34       | 24.00       |
| 23                  | 12.52          | 13.92       | 16.70       | 18.37       | 20.41       | 22.96       |
| 24                  | 12.00          | 13.34       | 16.00       | 17.60       | 19.56       | 22.00       |
| 25                  | 11.52          | 12.80       | 15.36       | 16.90       | 18.78       | 21.12       |
| 26                  | 11.08          | 12.31       | 14.77       | 16.25       | 18.06       | 20.31       |
| 27                  | 10.67          | 11.85       | 14.23       | 15.65       | 17.39       | 19.56       |
| 28                  | 10.29          | 11.43       | 13.72       | 15.09       | 16.77       | 18.86       |
| 29                  | 9.93           | 11.04       | 13.24       | 14.57       | 16.19       | 18.21       |
| 30                  | 9.60           | 10.67       | 12.80       | 14.08       | 15.65       | 17.60       |
| 31                  | 9.29           | 10.33       | 12.39       | 13.63       | 15.14       | 17.04       |
| 32                  | 9.00           | 10.00       | 12.00       | 13.20       | 14.67       | 16.50       |
| 33                  | 8.73           | 9.70        | 11.64       | 12.80       | 14.23       | 16.00       |
| 34                  | 8.47           | 9.41        | 11.30       | 12.43       | 13.81       | 15.53       |
| 35                  | 8.23           | 9.14        | 10.97       | 12.07       | 13.41       | 15.09       |
| 36                  | 8.00           | 8.89        | 10.67       | 11.74       | 13.04       | 14.67       |
| 37                  | 7.79           | 8.65        | 10.38       | 11.42       | 12.69       | 14.27       |
| 38                  | 7.58           | 8.43        | 10.11       | 11.12       | 12.36       | 13.90       |
| 39                  | 7.39           | 8.21        | 9.85        | 10.83       | 12.04       | 13.54       |
| 40                  | 7.20           | 8.00        | 9.60        | 10.56       | 11.74       | 13.20       |
| 41                  | 7.03           | 7.81        | 9.37        | 10.30       | 11.45       | 12.88       |
| 42                  | 6.86           | 7.62        | 9.15        | 10.06       | 11.18       | 12.58       |
| 43                  | 6.70           | 7.44        | 8.93        | 9.82        | 10.92       | 12.28       |
| 44                  | 6.55           | 7.27        | 8.73        | 9.60        | 10.67       | 12.00       |
| 45                  | 6.40           | 7.11        | 8.54        | 9.39        | 10.43       | 11.74       |
| 46                  | 6.26           | 6.96        | 8.35        | 9.19        | 10.21       | 11.48       |
| 47                  | 6.13           | 6.81        | 8.17        | 8.99        | 9.99        | 11.24       |
| 48                  | 6.00           | 6.67        | 8.00        | 8.80        | 9.78        | 11.00       |
| 49                  | 5.88           | 6.53        | 7.84        | 8.62        | 9.58        | 10.78       |
| 50                  | 5.76           | 6.40        | 7.68        | 8.45        | 9.39        | 10.56       |
| 51                  | 5.65           | 6.28        | 7.53        | 8.28        | 9.20        | 10.35       |
| 52                  | 5.54           | 6.16        | 7.39        | 8.13        | 9.03        | 10.16       |
| 53                  | 5.44           | 6.04        | 7.25        | 7.97        | 8.86        | 9.96        |
| 54                  | 5.33           | 5.93        | 7.11        | 7.82        | 8.69        | 9.78        |
| 55                  | 5.24           | 5.82        | 6.98        | 7.68        | 8.54        | 9.60        |
| 56                  | 5.14           | 5.72        | 6.86        | 7.55        | 8.39        | 9.43        |
| 57                  | 5.05           | 5.62        | 6.74        | 7.41        | 8.24        | 9.26        |
| 58                  | 4.97           | 5.52        | 6.62        | 7.29        | 8.10        | 9.10        |
| 59                  | 4.88           | 5.42        | 6.51        | 7.16        | 7.96        | 8.95        |
| 60                  | 4.80           | 5.33        | 6.40        | 7.04        | 7.82        | 8.80        |
| Constants           | 288.06         | 320.06      | 384.08      | 422.48      | 469.43      | 528.10      |

# TWIST GEARING TABLE

42" TWISTERS

**CYLINDER 7 INCHES DIAM. WHIRL  $1\frac{3}{4}$  INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 3.77

**FRONT ROLL  $1\frac{1}{2}$  INCHES DIAM. FRONT ROLL GEAR 112 TEETH**

| Change<br><br>Gears | TWIST PER INCH |            |            |             |             |             |
|---------------------|----------------|------------|------------|-------------|-------------|-------------|
|                     | Cyl. 70 T.     | Cyl. 60 T. | Cyl. 50 T. | Cyl. 50 T.  | Cyl. 45 T.  | Cyl. 40 T.  |
|                     | Jack 96 T.     | Jack 96 T. | Jack 96 T. | Jack 112 T. | Jack 112 T. | Jack 112 T. |
| 16                  | 7.68           | 8.96       | 10.75      | 12.54       | 13.94       | 15.68       |
| 17                  | 7.23           | 8.43       | 10.12      | 11.81       | 13.12       | 14.76       |
| 18                  | 6.83           | 7.96       | 9.56       | 11.15       | 12.39       | 13.94       |
| 19                  | 6.47           | 7.55       | 9.05       | 10.56       | 11.74       | 13.20       |
| 20                  | 6.14           | 7.17       | 8.60       | 10.04       | 11.15       | 12.54       |
| 21                  | 5.85           | 6.83       | 8.19       | 9.56        | 10.62       | 11.95       |
| 22                  | 5.59           | 6.52       | 7.82       | 9.12        | 10.14       | 11.40       |
| 23                  | 5.34           | 6.23       | 7.48       | 8.73        | 9.70        | 10.91       |
| 24                  | 5.12           | 5.97       | 7.17       | 8.36        | 9.29        | 10.45       |
| 25                  | 4.92           | 5.73       | 6.88       | 8.03        | 8.92        | 10.04       |
| 26                  | 4.73           | 5.51       | 6.62       | 7.72        | 8.58        | 9.65        |
| 27                  | 4.55           | 5.31       | 6.37       | 7.43        | 8.26        | 9.29        |
| 28                  | 4.39           | 5.12       | 6.14       | 7.17        | 7.96        | 8.96        |
| 29                  | 4.24           | 4.94       | 5.93       | 6.92        | 7.69        | 8.65        |
| 30                  | 4.10           | 4.78       | 5.73       | 6.69        | 7.43        | 8.36        |
| 31                  | 3.96           | 4.62       | 5.55       | 6.47        | 7.19        | 8.09        |
| 32                  | 3.84           | 4.48       | 5.38       | 6.27        | 6.97        | 7.84        |
| 33                  | 3.72           | 4.34       | 5.21       | 6.08        | 6.76        | 7.60        |
| 34                  | 3.61           | 4.22       | 5.06       | 5.90        | 6.56        | 7.38        |
| 35                  | 3.51           | 4.10       | 4.92       | 5.73        | 6.37        | 7.17        |
| 36                  | 3.41           | 3.98       | 4.78       | 5.58        | 6.19        | 6.97        |
| 37                  | 3.32           | 3.87       | 4.65       | 5.42        | 6.03        | 6.78        |
| 38                  | 3.23           | 3.78       | 4.53       | 5.28        | 5.87        | 6.60        |
| 39                  | 3.15           | 3.68       | 4.41       | 5.14        | 5.72        | 6.43        |
| 40                  | 3.07           | 3.58       | 4.30       | 5.02        | 5.58        | 6.27        |
| 41                  | 3.00           | 3.50       | 4.20       | 4.90        | 5.44        | 6.12        |
| 42                  | 2.93           | 3.42       | 4.10       | 4.78        | 5.31        | 5.98        |
| 43                  | 2.86           | 3.33       | 4.00       | 4.67        | 5.19        | 5.83        |
| 44                  | 2.79           | 3.26       | 3.91       | 4.56        | 5.07        | 5.70        |
| 45                  | 2.73           | 3.19       | 3.82       | 4.46        | 4.96        | 5.58        |
| 46                  | 2.67           | 3.12       | 3.74       | 4.37        | 4.85        | 5.46        |
| 47                  | 2.61           | 3.05       | 3.66       | 4.27        | 4.74        | 5.34        |
| 48                  | 2.56           | 2.99       | 3.59       | 4.18        | 4.65        | 5.23        |
| 49                  | 2.51           | 2.93       | 3.51       | 4.10        | 4.55        | 5.12        |
| 50                  | 2.46           | 2.87       | 3.44       | 4.01        | 4.46        | 5.02        |
| 51                  | 2.41           | 2.81       | 3.37       | 3.94        | 4.37        | 4.92        |
| 52                  | 2.36           | 2.76       | 3.31       | 3.86        | 4.29        | 4.83        |
| 53                  | 2.32           | 2.70       | 3.25       | 3.79        | 4.21        | 4.73        |
| 54                  | 2.28           | 2.65       | 3.19       | 3.72        | 4.13        | 4.65        |
| 55                  | 2.23           | 2.61       | 3.13       | 3.65        | 4.05        | 4.56        |
| 56                  | 2.19           | 2.56       | 3.07       | 3.59        | 3.98        | 4.48        |
| 57                  | 2.16           | 2.52       | 3.02       | 3.52        | 3.91        | 4.40        |
| 58                  | 2.12           | 2.47       | 2.97       | 3.46        | 3.85        | 4.33        |
| 59                  | 2.08           | 2.43       | 2.92       | 3.40        | 3.78        | 4.25        |
| 60                  | 2.05           | 2.39       | 2.87       | 3.35        | 3.72        | 4.18        |
| Constants           | 122.88         | 143.36     | 172.04     | 200.71      | 223.01      | 250.89      |

# TWIST GEARING TABLE—(Continued)

42" TWISTERS

**CYLINDER 7 INCHES DIAM. WHIRL  $1\frac{3}{4}$  INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 3.77

FRONT ROLL  $1\frac{1}{2}$  INCHES DIAM. FRONT ROLL GEAR 112 TEETH

| Change<br><br>Gears | TWIST PER INCH |             |             |             |             |             |
|---------------------|----------------|-------------|-------------|-------------|-------------|-------------|
|                     | Cyl. 40 T.     | Cyl. 36 T.  | Cyl. 30 T.  | Cyl. 30 T.  | Cyl. 27 T.  | Cyl. 24 T.  |
|                     | Jack 120 T.    | Jack 120 T. | Jack 120 T. | Jack 132 T. | Jack 132 T. | Jack 132 T. |
| 16                  | 16.80          | 18.67       | 22.40       | 24.64       | 27.38       | 30.80       |
| 17                  | 15.81          | 17.57       | 21.08       | 23.19       | 25.77       | 28.99       |
| 18                  | 14.93          | 16.59       | 19.91       | 21.90       | 24.34       | 27.38       |
| 19                  | 14.15          | 15.72       | 18.86       | 20.75       | 23.06       | 25.94       |
| 20                  | 13.44          | 14.93       | 17.92       | 19.71       | 21.90       | 24.64       |
| 21                  | 12.80          | 14.22       | 17.07       | 18.77       | 20.86       | 23.47       |
| 22                  | 12.22          | 13.58       | 16.29       | 17.92       | 19.91       | 22.40       |
| 23                  | 11.69          | 12.99       | 15.58       | 17.14       | 19.05       | 21.43       |
| 24                  | 11.20          | 12.44       | 14.93       | 16.43       | 18.25       | 20.53       |
| 25                  | 10.75          | 11.95       | 14.34       | 15.77       | 17.52       | 19.71       |
| 26                  | 10.34          | 11.49       | 13.79       | 15.16       | 16.85       | 18.95       |
| 27                  | 9.96           | 11.06       | 13.27       | 14.60       | 16.22       | 18.25       |
| 28                  | 9.60           | 10.67       | 12.80       | 14.08       | 15.65       | 17.60       |
| 29                  | 9.27           | 10.30       | 12.36       | 13.59       | 15.11       | 16.99       |
| 30                  | 8.96           | 9.96        | 11.95       | 13.14       | 14.60       | 16.43       |
| 31                  | 8.67           | 9.63        | 11.56       | 12.72       | 14.13       | 15.90       |
| 32                  | 8.40           | 9.33        | 11.20       | 12.32       | 13.69       | 15.40       |
| 33                  | 8.15           | 9.05        | 10.86       | 11.95       | 13.27       | 14.93       |
| 34                  | 7.91           | 8.78        | 10.54       | 11.60       | 12.88       | 14.49       |
| 35                  | 7.68           | 8.53        | 10.24       | 11.26       | 12.52       | 14.08       |
| 36                  | 7.47           | 8.30        | 9.96        | 10.95       | 12.17       | 13.69       |
| 37                  | 7.27           | 8.07        | 9.69        | 10.66       | 11.84       | 13.32       |
| 38                  | 7.07           | 7.86        | 9.43        | 10.38       | 11.53       | 12.97       |
| 39                  | 6.89           | 7.66        | 9.19        | 10.11       | 11.23       | 12.64       |
| 40                  | 6.72           | 7.47        | 8.96        | 9.86        | 10.95       | 12.32       |
| 41                  | 6.56           | 7.28        | 8.74        | 9.62        | 10.68       | 12.02       |
| 42                  | 6.40           | 7.11        | 8.54        | 9.39        | 10.43       | 11.74       |
| 43                  | 6.25           | 6.95        | 8.34        | 9.17        | 10.19       | 11.46       |
| 44                  | 6.11           | 6.79        | 8.15        | 8.96        | 9.96        | 11.20       |
| 45                  | 5.97           | 6.64        | 7.96        | 8.76        | 9.73        | 10.95       |
| 46                  | 5.84           | 6.50        | 7.79        | 8.57        | 9.52        | 10.72       |
| 47                  | 5.72           | 6.35        | 7.63        | 8.39        | 9.32        | 10.49       |
| 48                  | 5.60           | 6.22        | 7.47        | 8.22        | 9.13        | 10.27       |
| 49                  | 5.49           | 6.10        | 7.31        | 8.05        | 8.94        | 10.06       |
| 50                  | 5.38           | 5.97        | 7.17        | 7.89        | 8.76        | 9.86        |
| 51                  | 5.27           | 5.86        | 7.03        | 7.73        | 8.59        | 9.66        |
| 52                  | 5.17           | 5.75        | 6.90        | 7.58        | 8.43        | 9.48        |
| 53                  | 5.07           | 5.64        | 6.76        | 7.44        | 8.27        | 9.30        |
| 54                  | 4.98           | 5.53        | 6.64        | 7.30        | 8.11        | 9.13        |
| 55                  | 4.89           | 5.43        | 6.52        | 7.17        | 7.96        | 8.96        |
| 56                  | 4.80           | 5.34        | 6.40        | 7.04        | 7.83        | 8.80        |
| 57                  | 4.72           | 5.24        | 6.29        | 6.92        | 7.69        | 8.65        |
| 58                  | 4.63           | 5.15        | 6.18        | 6.80        | 7.56        | 8.50        |
| 59                  | 4.56           | 5.06        | 6.07        | 6.68        | 7.42        | 8.35        |
| 60                  | 4.48           | 4.98        | 5.97        | 6.57        | 7.30        | 8.21        |
| Constants           | 268.81         | 298.67      | 358.41      | 394.25      | 438.05      | 492.81      |

# TWIST GEARING TABLE

42" TWISTERS

CYLINDER 7 INCHES DIAM. WHIRL 2 INCHES DIAM.

RATIO OF CYLINDER TO WHIRL 1 TO 3.35

FRONT ROLL  $1\frac{1}{2}$  INCHES DIAM. FRONT ROLL GEAR 112 TEETH

| Change<br>Gears | TWIST PER INCH           |                          |                          |                           |                           |                           |
|-----------------|--------------------------|--------------------------|--------------------------|---------------------------|---------------------------|---------------------------|
|                 | Cyl. 70 T.<br>Jack 96 T. | Cyl. 60 T.<br>Jack 96 T. | Cyl. 50 T.<br>Jack 96 T. | Cyl. 50 T.<br>Jack 112 T. | Cyl. 45 T.<br>Jack 112 T. | Cyl. 40 T.<br>Jack 112 T. |
| 16              | 6.82                     | 7.96                     | 9.55                     | 11.15                     | 12.39                     | 13.93                     |
| 17              | 6.42                     | 7.49                     | 8.99                     | 10.49                     | 11.66                     | 13.11                     |
| 18              | 6.07                     | 7.08                     | 8.50                     | 9.91                      | 11.01                     | 12.38                     |
| 19              | 5.75                     | 6.70                     | 8.05                     | 9.39                      | 10.43                     | 11.73                     |
| 20              | 5.46                     | 6.37                     | 7.64                     | 8.92                      | 9.91                      | 11.15                     |
| 21              | 5.20                     | 6.07                     | 7.28                     | 8.49                      | 9.44                      | 10.62                     |
| 22              | 4.96                     | 5.79                     | 6.95                     | 8.11                      | 9.01                      | 10.13                     |
| 23              | 4.75                     | 5.54                     | 6.65                     | 7.75                      | 8.62                      | 9.69                      |
| 24              | 4.55                     | 5.31                     | 6.37                     | 7.43                      | 8.26                      | 9.29                      |
| 25              | 4.37                     | 5.10                     | 6.11                     | 7.13                      | 7.93                      | 8.92                      |
| 26              | 4.20                     | 4.90                     | 5.87                     | 6.86                      | 7.62                      | 8.57                      |
| 27              | 4.04                     | 4.72                     | 5.66                     | 6.61                      | 7.34                      | 8.26                      |
| 28              | 3.90                     | 4.55                     | 5.46                     | 6.37                      | 7.08                      | 7.96                      |
| 29              | 3.77                     | 4.39                     | 5.27                     | 6.15                      | 6.83                      | 7.69                      |
| 30              | 3.64                     | 4.25                     | 5.10                     | 5.95                      | 6.61                      | 7.43                      |
| 31              | 3.52                     | 4.11                     | 4.93                     | 5.75                      | 6.39                      | 7.19                      |
| 32              | 3.41                     | 3.98                     | 4.77                     | 5.57                      | 6.19                      | 6.96                      |
| 33              | 3.31                     | 3.86                     | 4.63                     | 5.40                      | 6.00                      | 6.75                      |
| 34              | 3.21                     | 3.75                     | 4.50                     | 5.25                      | 5.83                      | 6.56                      |
| 35              | 3.12                     | 3.64                     | 4.37                     | 5.10                      | 5.66                      | 6.37                      |
| 36              | 3.03                     | 3.54                     | 4.25                     | 4.96                      | 5.50                      | 6.19                      |
| 37              | 2.95                     | 3.44                     | 4.13                     | 4.82                      | 5.36                      | 6.02                      |
| 38              | 2.87                     | 3.35                     | 4.02                     | 4.70                      | 5.21                      | 5.87                      |
| 39              | 2.80                     | 3.27                     | 3.92                     | 4.57                      | 5.08                      | 5.72                      |
| 40              | 2.73                     | 3.18                     | 3.82                     | 4.46                      | 4.95                      | 5.57                      |
| 41              | 2.66                     | 3.11                     | 3.73                     | 4.35                      | 4.83                      | 5.44                      |
| 42              | 2.60                     | 3.04                     | 3.64                     | 4.25                      | 4.72                      | 5.31                      |
| 43              | 2.54                     | 2.96                     | 3.56                     | 4.15                      | 4.61                      | 5.18                      |
| 44              | 2.48                     | 2.90                     | 3.47                     | 4.05                      | 4.50                      | 5.07                      |
| 45              | 2.43                     | 2.83                     | 3.40                     | 3.96                      | 4.40                      | 4.95                      |
| 46              | 2.37                     | 2.77                     | 3.32                     | 3.88                      | 4.31                      | 4.84                      |
| 47              | 2.32                     | 2.71                     | 3.25                     | 3.79                      | 4.22                      | 4.74                      |
| 48              | 2.27                     | 2.66                     | 3.18                     | 3.72                      | 4.13                      | 4.65                      |
| 49              | 2.23                     | 2.60                     | 3.12                     | 3.64                      | 4.04                      | 4.55                      |
| 50              | 2.18                     | 2.55                     | 3.06                     | 3.57                      | 3.96                      | 4.46                      |
| 51              | 2.14                     | 2.49                     | 3.00                     | 3.50                      | 3.89                      | 4.37                      |
| 52              | 2.10                     | 2.45                     | 2.94                     | 3.43                      | 3.81                      | 4.29                      |
| 53              | 2.06                     | 2.40                     | 2.88                     | 3.37                      | 3.74                      | 4.21                      |
| 54              | 2.02                     | 2.36                     | 2.83                     | 3.30                      | 3.67                      | 4.13                      |
| 55              | 1.99                     | 2.32                     | 2.78                     | 3.24                      | 3.60                      | 4.05                      |
| 56              | 1.95                     | 2.27                     | 2.73                     | 3.19                      | 3.54                      | 3.98                      |
| 57              | 1.92                     | 2.23                     | 2.68                     | 3.13                      | 3.48                      | 3.91                      |
| 58              | 1.88                     | 2.20                     | 2.64                     | 3.08                      | 3.42                      | 3.84                      |
| 59              | 1.85                     | 2.16                     | 2.59                     | 3.02                      | 3.36                      | 3.77                      |
| 60              | 1.82                     | 2.12                     | 2.55                     | 2.97                      | 3.30                      | 3.72                      |
| Constants       | 109.19                   | 127.39                   | 152.87                   | 178.35                    | 198.16                    | 222.94                    |



# TWIST GEARING TABLE—(Continued)

42" TWISTERS

**CYLINDER 7 INCHES DIAM. WHIRL 2 INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 3.35

FRONT ROLL 1½ INCHES DIAM. FRONT ROLL GEAR 112 TEETH

| Change<br><br>Gears | TWIST PER INCH |             |             |             |             |             |
|---------------------|----------------|-------------|-------------|-------------|-------------|-------------|
|                     | Cyl. 40 T.     | Cyl. 36 T.  | Cyl. 30 T.  | Cyl. 30 T.  | Cyl. 27 T.  | Cyl. 24 T.  |
|                     | Jack 120 T.    | Jack 120 T. | Jack 120 T. | Jack 132 T. | Jack 132 T. | Jack 132 T. |
| 16                  | 14.93          | 16.59       | 19.91       | 21.90       | 24.33       | 27.37       |
| 17                  | 14.05          | 15.61       | 18.73       | 20.61       | 22.90       | 25.76       |
| 18                  | 13.27          | 14.74       | 17.69       | 19.46       | 21.63       | 24.33       |
| 19                  | 12.57          | 13.97       | 16.76       | 18.44       | 20.49       | 23.05       |
| 20                  | 11.94          | 13.27       | 15.92       | 17.52       | 19.46       | 21.90       |
| 21                  | 11.37          | 12.64       | 15.17       | 16.68       | 18.54       | 20.85       |
| 22                  | 10.86          | 12.06       | 14.48       | 15.92       | 17.69       | 19.91       |
| 23                  | 10.39          | 11.54       | 13.85       | 15.23       | 16.92       | 19.04       |
| 24                  | 9.95           | 11.06       | 13.27       | 14.60       | 16.22       | 18.25       |
| 25                  | 9.55           | 10.62       | 12.74       | 14.01       | 15.57       | 17.52       |
| 26                  | 9.19           | 10.21       | 12.25       | 13.47       | 14.97       | 16.84       |
| 27                  | 8.85           | 9.83        | 11.80       | 12.98       | 14.42       | 16.22       |
| 28                  | 8.53           | 9.48        | 11.37       | 12.51       | 13.90       | 15.64       |
| 29                  | 8.24           | 9.15        | 10.98       | 12.08       | 13.42       | 15.10       |
| 30                  | 7.96           | 8.85        | 10.62       | 11.68       | 12.98       | 14.60       |
| 31                  | 7.71           | 8.56        | 10.27       | 11.30       | 12.56       | 14.13       |
| 32                  | 7.47           | 8.29        | 9.95        | 10.95       | 12.16       | 13.68       |
| 33                  | 7.24           | 8.04        | 9.65        | 10.62       | 11.80       | 13.27       |
| 34                  | 7.03           | 7.81        | 9.37        | 10.30       | 11.45       | 12.88       |
| 35                  | 6.82           | 7.58        | 9.10        | 10.01       | 11.12       | 12.51       |
| 36                  | 6.64           | 7.37        | 8.85        | 9.73        | 10.82       | 12.17       |
| 37                  | 6.46           | 7.17        | 8.61        | 9.47        | 10.52       | 11.84       |
| 38                  | 6.29           | 6.98        | 8.38        | 9.22        | 10.25       | 11.53       |
| 39                  | 6.12           | 6.81        | 8.17        | 8.98        | 9.98        | 11.23       |
| 40                  | 5.97           | 6.64        | 7.96        | 8.76        | 9.73        | 10.95       |
| 41                  | 5.83           | 6.47        | 7.77        | 8.54        | 9.49        | 10.68       |
| 42                  | 5.69           | 6.32        | 7.59        | 8.34        | 9.27        | 10.43       |
| 43                  | 5.56           | 6.17        | 7.41        | 8.15        | 9.05        | 10.18       |
| 44                  | 5.43           | 6.03        | 7.24        | 7.96        | 8.85        | 9.95        |
| 45                  | 5.31           | 5.90        | 7.08        | 7.79        | 8.65        | 9.73        |
| 46                  | 5.20           | 5.77        | 6.93        | 7.62        | 8.46        | 9.52        |
| 47                  | 5.08           | 5.65        | 6.78        | 7.45        | 8.28        | 9.32        |
| 48                  | 4.98           | 5.53        | 6.64        | 7.30        | 8.11        | 9.13        |
| 49                  | 4.87           | 5.42        | 6.50        | 7.15        | 7.94        | 8.94        |
| 50                  | 4.78           | 5.31        | 6.37        | 7.01        | 7.79        | 8.76        |
| 51                  | 4.68           | 5.20        | 6.24        | 6.87        | 7.64        | 8.59        |
| 52                  | 4.60           | 5.11        | 6.13        | 6.74        | 7.49        | 8.42        |
| 53                  | 4.51           | 5.01        | 6.01        | 6.61        | 7.34        | 8.26        |
| 54                  | 4.43           | 4.91        | 5.90        | 6.49        | 7.21        | 8.11        |
| 55                  | 4.34           | 4.83        | 5.79        | 6.37        | 7.08        | 7.96        |
| 56                  | 4.27           | 4.74        | 5.69        | 6.26        | 6.95        | 7.82        |
| 57                  | 4.19           | 4.66        | 5.59        | 6.15        | 6.83        | 7.68        |
| 58                  | 4.12           | 4.58        | 5.49        | 6.04        | 6.71        | 7.55        |
| 59                  | 4.05           | 4.50        | 5.40        | 5.94        | 6.59        | 7.42        |
| 60                  | 3.98           | 4.42        | 5.31        | 5.84        | 6.49        | 7.30        |
| Constants           | 238.86         | 265.40      | 318.48      | 350.33      | 389.25      | 437.91      |

**TWIST GEARING TABLE**

42" TWISTERS

**CYLINDER 7 INCHES DIAM. WHIRL 2½ INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 2.96

**FRONT ROLL 1½ INCHES DIAM. FRONT ROLL GEAR 112 TEETH**

| Change<br><br>Gears | TWIST PER INCH |            |            |             |             |             |
|---------------------|----------------|------------|------------|-------------|-------------|-------------|
|                     | Cyl. 70 T.     | Cyl. 60 T. | Cyl. 50 T. | Cyl. 50 T.  | Cyl. 45 T.  | Cyl. 40 T.  |
|                     | Jack 96 T.     | Jack 96 T. | Jack 96 T. | Jack 112 T. | Jack 112 T. | Jack 112 T. |
| 16                  | 6.06           | 7.04       | 8.44       | 9.85        | 10.94       | 12.31       |
| 17                  | 5.71           | 6.62       | 7.94       | 9.27        | 10.30       | 11.59       |
| 18                  | 5.39           | 6.25       | 7.50       | 8.76        | 9.73        | 10.94       |
| 19                  | 5.10           | 5.92       | 7.11       | 8.29        | 9.22        | 10.37       |
| 20                  | 4.85           | 5.63       | 6.75       | 7.88        | 8.75        | 9.85        |
| 21                  | 4.62           | 5.36       | 6.43       | 7.50        | 8.34        | 9.38        |
| 22                  | 4.41           | 5.12       | 6.14       | 7.16        | 7.96        | 8.95        |
| 23                  | 4.22           | 4.89       | 5.87       | 6.85        | 7.61        | 8.56        |
| 24                  | 4.04           | 4.69       | 5.63       | 6.57        | 7.30        | 8.21        |
| 25                  | 3.88           | 4.50       | 5.40       | 6.30        | 7.00        | 7.88        |
| 26                  | 3.73           | 4.33       | 5.20       | 6.06        | 6.73        | 7.58        |
| 27                  | 3.59           | 4.17       | 5.00       | 5.83        | 6.48        | 7.30        |
| 28                  | 3.46           | 4.02       | 4.82       | 5.63        | 6.25        | 7.04        |
| 29                  | 3.34           | 3.88       | 4.66       | 5.43        | 6.04        | 6.79        |
| 30                  | 3.23           | 3.75       | 4.50       | 5.25        | 5.84        | 6.57        |
| 31                  | 3.13           | 3.63       | 4.36       | 5.08        | 5.65        | 6.35        |
| 32                  | 3.03           | 3.52       | 4.22       | 4.93        | 5.47        | 6.16        |
| 33                  | 2.94           | 3.41       | 4.09       | 4.78        | 5.31        | 5.97        |
| 34                  | 2.86           | 3.31       | 3.97       | 4.64        | 5.15        | 5.80        |
| 35                  | 2.77           | 3.22       | 3.86       | 4.50        | 5.00        | 5.63        |
| 36                  | 2.69           | 3.13       | 3.75       | 4.38        | 4.86        | 5.47        |
| 37                  | 2.62           | 3.04       | 3.65       | 4.26        | 4.73        | 5.32        |
| 38                  | 2.55           | 2.96       | 3.56       | 4.15        | 4.61        | 5.19        |
| 39                  | 2.48           | 2.89       | 3.46       | 4.04        | 4.49        | 5.05        |
| 40                  | 2.42           | 2.82       | 3.38       | 3.94        | 4.38        | 4.93        |
| 41                  | 2.37           | 2.75       | 3.29       | 3.84        | 4.27        | 4.80        |
| 42                  | 2.31           | 2.68       | 3.22       | 3.75        | 4.17        | 4.69        |
| 43                  | 2.26           | 2.62       | 3.14       | 3.66        | 4.07        | 4.58        |
| 44                  | 2.20           | 2.56       | 3.07       | 3.58        | 3.98        | 4.48        |
| 45                  | 2.16           | 2.50       | 3.00       | 3.50        | 3.89        | 4.38        |
| 46                  | 2.11           | 2.45       | 2.94       | 3.43        | 3.81        | 4.28        |
| 47                  | 2.06           | 2.39       | 2.87       | 3.35        | 3.73        | 4.19        |
| 48                  | 2.02           | 2.35       | 2.82       | 3.28        | 3.65        | 4.11        |
| 49                  | 1.98           | 2.30       | 2.76       | 3.22        | 3.57        | 4.02        |
| 50                  | 1.94           | 2.25       | 2.70       | 3.15        | 3.50        | 3.94        |
| 51                  | 1.90           | 2.21       | 2.65       | 3.09        | 3.43        | 3.86        |
| 52                  | 1.87           | 2.17       | 2.60       | 3.03        | 3.37        | 3.79        |
| 53                  | 1.83           | 2.12       | 2.55       | 2.97        | 3.30        | 3.72        |
| 54                  | 1.80           | 2.09       | 2.50       | 2.92        | 3.24        | 3.65        |
| 55                  | 1.76           | 2.05       | 2.46       | 2.87        | 3.18        | 3.58        |
| 56                  | 1.73           | 2.01       | 2.41       | 2.82        | 3.13        | 3.52        |
| 57                  | 1.70           | 1.98       | 2.37       | 2.76        | 3.07        | 3.46        |
| 58                  | 1.67           | 1.94       | 2.33       | 2.72        | 3.02        | 3.40        |
| 59                  | 1.64           | 1.91       | 2.29       | 2.67        | 2.97        | 3.34        |
| 60                  | 1.62           | 1.88       | 2.25       | 2.63        | 2.92        | 3.29        |
| Constants           | 96.99          | 112.56     | 135.07     | 157.59      | 175.09      | 196.98      |

# TWIST GEARING TABLE—(Continued)

42" TWISTERS

**CYLINDER 7 INCHES DIAM. WHIRL 2½ INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 2.96

**FRONT ROLL 1½ INCHES DIAM. FRONT ROLL GEAR 112 TEETH**

| Change<br><br>Gears | TWIST PER INCH |             |             |             |             |             |
|---------------------|----------------|-------------|-------------|-------------|-------------|-------------|
|                     | Cyl. 40 T.     | Cyl. 36 T.  | Cyl. 30 T.  | Cyl. 30 T.  | Cyl. 27 T.  | Cyl. 24 T.  |
|                     | Jack 120 T.    | Jack 120 T. | Jack 120 T. | Jack 132 T. | Jack 132 T. | Jack 132 T. |
| 16                  | 13.19          | 14.66       | 17.59       | 19.35       | 21.50       | 24.18       |
| 17                  | 12.41          | 13.79       | 16.55       | 18.21       | 20.23       | 22.76       |
| 18                  | 11.73          | 13.03       | 15.63       | 17.20       | 19.11       | 21.50       |
| 19                  | 11.11          | 12.34       | 14.81       | 16.29       | 18.10       | 20.36       |
| 20                  | 10.55          | 11.73       | 14.07       | 15.48       | 17.20       | 19.35       |
| 21                  | 10.05          | 11.17       | 13.40       | 14.74       | 16.38       | 18.43       |
| 22                  | 9.59           | 10.66       | 12.79       | 14.07       | 15.63       | 17.59       |
| 23                  | 9.18           | 10.20       | 12.23       | 13.46       | 14.95       | 16.82       |
| 24                  | 8.79           | 9.77        | 11.73       | 12.90       | 14.33       | 16.12       |
| 25                  | 8.44           | 9.38        | 11.26       | 12.38       | 13.76       | 15.48       |
| 26                  | 8.12           | 9.02        | 10.82       | 11.91       | 13.23       | 14.88       |
| 27                  | 7.82           | 8.69        | 10.42       | 11.47       | 12.74       | 14.33       |
| 28                  | 7.54           | 8.38        | 10.05       | 11.06       | 12.28       | 13.82       |
| 29                  | 7.28           | 8.09        | 9.70        | 10.67       | 11.86       | 13.34       |
| 30                  | 7.04           | 7.82        | 9.38        | 10.32       | 11.46       | 12.90       |
| 31                  | 6.81           | 7.56        | 9.08        | 9.99        | 11.09       | 12.48       |
| 32                  | 6.60           | 7.33        | 8.80        | 9.67        | 10.75       | 12.09       |
| 33                  | 6.40           | 7.11        | 8.53        | 9.38        | 10.42       | 11.73       |
| 34                  | 6.21           | 6.90        | 8.28        | 9.11        | 10.12       | 11.38       |
| 35                  | 6.03           | 6.70        | 8.04        | 8.84        | 9.83        | 11.06       |
| 36                  | 5.87           | 6.52        | 7.82        | 8.60        | 9.56        | 10.75       |
| 37                  | 5.70           | 6.34        | 7.61        | 8.37        | 9.30        | 10.45       |
| 38                  | 5.55           | 6.17        | 7.41        | 8.15        | 9.05        | 10.18       |
| 39                  | 5.41           | 6.01        | 7.22        | 7.94        | 8.82        | 9.92        |
| 40                  | 5.28           | 5.87        | 7.04        | 7.74        | 8.60        | 9.68        |
| 41                  | 5.15           | 5.72        | 6.86        | 7.55        | 8.39        | 9.44        |
| 42                  | 5.03           | 5.59        | 6.70        | 7.37        | 8.19        | 9.22        |
| 43                  | 4.91           | 5.45        | 6.54        | 7.20        | 8.00        | 9.00        |
| 44                  | 4.80           | 5.33        | 6.40        | 7.04        | 7.82        | 8.80        |
| 45                  | 4.69           | 5.21        | 6.25        | 6.88        | 7.64        | 8.60        |
| 46                  | 4.59           | 5.10        | 6.12        | 6.73        | 7.48        | 8.41        |
| 47                  | 4.49           | 4.99        | 5.99        | 6.59        | 7.32        | 8.23        |
| 48                  | 4.40           | 4.89        | 5.87        | 6.45        | 7.17        | 8.06        |
| 49                  | 4.31           | 4.79        | 5.74        | 6.32        | 7.02        | 7.90        |
| 50                  | 4.22           | 4.69        | 5.63        | 6.19        | 6.88        | 7.74        |
| 51                  | 4.14           | 4.60        | 5.52        | 6.07        | 6.74        | 7.59        |
| 52                  | 4.06           | 4.51        | 5.41        | 5.96        | 6.62        | 7.44        |
| 53                  | 3.98           | 4.42        | 5.31        | 5.84        | 6.49        | 7.30        |
| 54                  | 3.91           | 4.34        | 5.21        | 5.74        | 6.37        | 7.17        |
| 55                  | 3.84           | 4.26        | 5.12        | 5.63        | 6.25        | 7.04        |
| 56                  | 3.77           | 4.19        | 5.03        | 5.53        | 6.14        | 6.91        |
| 57                  | 3.70           | 4.11        | 4.94        | 5.43        | 6.03        | 6.79        |
| 58                  | 3.64           | 4.04        | 4.85        | 5.34        | 5.93        | 6.67        |
| 59                  | 3.58           | 3.97        | 4.77        | 5.25        | 5.83        | 6.56        |
| 60                  | 3.52           | 3.91        | 4.69        | 5.16        | 5.73        | 6.45        |
| Constants           | 211.05         | 234.50      | 281.40      | 309.56      | 343.94      | 386.93      |

# TWIST GEARING TABLE FOR TWISTING

## TWIST GEARING TABLE

42" TWISTERS

**CYLINDER 7 INCHES DIAM. WHIRL 2½ INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 2.64

**FRONT ROLL 1½ INCHES DIAM. FRONT ROLL GEAR 112 TEETH**

| Change<br><br>Gears | TWIST PER INCH |            |            |             |             |             |
|---------------------|----------------|------------|------------|-------------|-------------|-------------|
|                     | Cyl. 70 T.     | Cyl. 60 T. | Cyl. 50 T. | Cyl. 50 T.  | Cyl. 45 T.  | Cyl. 40 T.  |
|                     | Jack 96 T.     | Jack 96 T. | Jack 96 T. | Jack 112 T. | Jack 112 T. | Jack 112 T. |
| 16                  | 5.38           | 6.27       | 7.53       | 8.78        | 9.76        | 10.98       |
| 17                  | 5.06           | 5.91       | 7.09       | 8.27        | 9.19        | 10.33       |
| 18                  | 4.78           | 5.58       | 6.69       | 7.81        | 8.68        | 9.76        |
| 19                  | 4.52           | 5.28       | 6.34       | 7.40        | 8.22        | 9.25        |
| 20                  | 4.30           | 5.02       | 6.02       | 7.03        | 7.81        | 8.78        |
| 21                  | 4.10           | 4.78       | 5.74       | 6.69        | 7.44        | 8.37        |
| 22                  | 3.91           | 4.56       | 5.48       | 6.39        | 7.10        | 7.99        |
| 23                  | 3.74           | 4.36       | 5.24       | 6.11        | 6.79        | 7.64        |
| 24                  | 3.59           | 4.18       | 5.02       | 5.86        | 6.51        | 7.32        |
| 25                  | 3.44           | 4.02       | 4.81       | 5.62        | 6.25        | 7.03        |
| 26                  | 3.31           | 3.86       | 4.63       | 5.41        | 6.01        | 6.76        |
| 27                  | 3.19           | 3.72       | 4.46       | 5.21        | 5.78        | 6.51        |
| 28                  | 3.07           | 3.58       | 4.30       | 5.02        | 5.58        | 6.27        |
| 29                  | 2.97           | 3.46       | 4.15       | 4.85        | 5.39        | 6.06        |
| 30                  | 2.87           | 3.35       | 4.02       | 4.69        | 5.21        | 5.86        |
| 31                  | 2.78           | 3.24       | 3.89       | 4.53        | 5.04        | 5.67        |
| 32                  | 2.69           | 3.14       | 3.76       | 4.39        | 4.88        | 5.49        |
| 33                  | 2.61           | 3.04       | 3.65       | 4.26        | 4.73        | 5.32        |
| 34                  | 2.53           | 2.95       | 3.54       | 4.13        | 4.59        | 5.17        |
| 35                  | 2.46           | 2.87       | 3.44       | 4.02        | 4.46        | 5.02        |
| 36                  | 2.39           | 2.79       | 3.35       | 3.90        | 4.34        | 4.88        |
| 37                  | 2.33           | 2.71       | 3.26       | 3.80        | 4.22        | 4.75        |
| 38                  | 2.26           | 2.64       | 3.17       | 3.70        | 4.11        | 4.62        |
| 39                  | 2.21           | 2.57       | 3.09       | 3.60        | 4.00        | 4.50        |
| 40                  | 2.15           | 2.51       | 3.01       | 3.51        | 3.90        | 4.39        |
| 41                  | 2.10           | 2.45       | 2.94       | 3.43        | 3.81        | 4.29        |
| 42                  | 2.05           | 2.39       | 2.87       | 3.35        | 3.72        | 4.18        |
| 43                  | 2.01           | 2.33       | 2.80       | 3.27        | 3.63        | 4.09        |
| 44                  | 1.96           | 2.28       | 2.74       | 3.19        | 3.55        | 3.99        |
| 45                  | 1.91           | 2.23       | 2.68       | 3.12        | 3.47        | 3.90        |
| 46                  | 1.87           | 2.18       | 2.62       | 3.06        | 3.40        | 3.82        |
| 47                  | 1.83           | 2.14       | 2.56       | 2.99        | 3.32        | 3.74        |
| 48                  | 1.79           | 2.09       | 2.51       | 2.93        | 3.25        | 3.66        |
| 49                  | 1.76           | 2.05       | 2.46       | 2.87        | 3.19        | 3.59        |
| 50                  | 1.72           | 2.01       | 2.41       | 2.81        | 3.12        | 3.51        |
| 51                  | 1.69           | 1.97       | 2.36       | 2.76        | 3.06        | 3.44        |
| 52                  | 1.65           | 1.93       | 2.32       | 2.70        | 3.00        | 3.38        |
| 53                  | 1.62           | 1.89       | 2.27       | 2.65        | 2.95        | 3.32        |
| 54                  | 1.59           | 1.86       | 2.23       | 2.60        | 2.89        | 3.25        |
| 55                  | 1.56           | 1.83       | 2.19       | 2.56        | 2.84        | 3.19        |
| 56                  | 1.54           | 1.79       | 2.15       | 2.51        | 2.79        | 3.14        |
| 57                  | 1.51           | 1.76       | 2.11       | 2.47        | 2.74        | 3.08        |
| 58                  | 1.48           | 1.73       | 2.08       | 2.42        | 2.69        | 3.03        |
| 59                  | 1.46           | 1.70       | 2.04       | 2.38        | 2.65        | 2.98        |
| 60                  | 1.43           | 1.67       | 2.01       | 2.34        | 2.60        | 2.93        |
| Constants           | 86.05          | 100.39     | 120.47     | 140.55      | 156.17      | 175.69      |

# TWIST GEARING TABLE —(Continued)

42" TWISTERS

**CYLINDER 7 INCHES DIAM. WHIRL 2½ INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 2.64

**FRONT ROLL 1½ INCHES DIAM. FRONT ROLL GEAR 112 TEETH**

| Change<br><br>Gears | TWIST PER INCH            |                           |                           |                           |                           |                           |
|---------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
|                     | Cyl. 40 T.<br>Jack 120 T. | Cyl. 36 T.<br>Jack 120 T. | Cyl. 30 T.<br>Jack 120 T. | Cyl. 30 T.<br>Jack 132 T. | Cyl. 27 T.<br>Jack 132 T. | Cyl. 24 T.<br>Jack 132 T. |
| 16                  | 11.77                     | 13.07                     | 15.69                     | 17.26                     | 19.17                     | 21.57                     |
| 17                  | 11.07                     | 12.30                     | 14.76                     | 16.24                     | 18.04                     | 20.30                     |
| 18                  | 10.46                     | 11.62                     | 13.94                     | 15.34                     | 17.04                     | 19.17                     |
| 19                  | 9.91                      | 11.01                     | 13.21                     | 14.53                     | 16.14                     | 18.16                     |
| 20                  | 9.41                      | 10.46                     | 12.55                     | 13.80                     | 15.34                     | 17.26                     |
| 21                  | 8.96                      | 9.96                      | 11.95                     | 13.15                     | 14.61                     | 16.43                     |
| 22                  | 8.56                      | 9.51                      | 11.41                     | 12.55                     | 13.94                     | 15.69                     |
| 23                  | 8.18                      | 9.09                      | 10.91                     | 12.00                     | 13.34                     | 15.00                     |
| 24                  | 7.84                      | 8.71                      | 10.46                     | 11.50                     | 12.78                     | 14.38                     |
| 25                  | 7.53                      | 8.37                      | 10.04                     | 11.04                     | 12.27                     | 13.80                     |
| 26                  | 7.24                      | 8.04                      | 9.65                      | 10.62                     | 11.80                     | 13.27                     |
| 27                  | 6.97                      | 7.75                      | 9.30                      | 10.23                     | 11.36                     | 12.78                     |
| 28                  | 6.72                      | 7.47                      | 8.96                      | 9.86                      | 10.96                     | 12.33                     |
| 29                  | 6.49                      | 7.21                      | 8.65                      | 9.52                      | 10.58                     | 11.90                     |
| 30                  | 6.27                      | 6.97                      | 8.37                      | 9.20                      | 10.23                     | 11.50                     |
| 31                  | 6.07                      | 6.75                      | 8.10                      | 8.91                      | 9.90                      | 11.13                     |
| 32                  | 5.88                      | 6.54                      | 7.84                      | 8.63                      | 9.59                      | 10.78                     |
| 33                  | 5.70                      | 6.34                      | 7.61                      | 8.37                      | 9.30                      | 10.46                     |
| 34                  | 5.54                      | 6.15                      | 7.38                      | 8.12                      | 9.02                      | 10.15                     |
| 35                  | 5.38                      | 5.98                      | 7.17                      | 7.89                      | 8.76                      | 9.86                      |
| 36                  | 5.23                      | 5.81                      | 6.97                      | 7.67                      | 8.52                      | 9.58                      |
| 37                  | 5.09                      | 5.65                      | 6.78                      | 7.46                      | 8.29                      | 9.33                      |
| 38                  | 4.95                      | 5.50                      | 6.60                      | 7.27                      | 8.07                      | 9.08                      |
| 39                  | 4.83                      | 5.36                      | 6.44                      | 7.08                      | 7.87                      | 8.85                      |
| 40                  | 4.71                      | 5.23                      | 6.27                      | 6.90                      | 7.67                      | 8.63                      |
| 41                  | 4.59                      | 5.10                      | 6.12                      | 6.73                      | 7.48                      | 8.42                      |
| 42                  | 4.48                      | 4.98                      | 5.98                      | 6.57                      | 7.30                      | 8.22                      |
| 43                  | 4.38                      | 4.86                      | 5.84                      | 6.42                      | 7.13                      | 8.03                      |
| 44                  | 4.28                      | 4.75                      | 5.70                      | 6.27                      | 6.97                      | 7.84                      |
| 45                  | 4.18                      | 4.65                      | 5.58                      | 6.14                      | 6.82                      | 7.67                      |
| 46                  | 4.09                      | 4.55                      | 5.46                      | 6.00                      | 6.67                      | 7.50                      |
| 47                  | 4.01                      | 4.45                      | 5.34                      | 5.87                      | 6.53                      | 7.34                      |
| 48                  | 3.92                      | 4.36                      | 5.23                      | 5.75                      | 6.39                      | 7.19                      |
| 49                  | 3.84                      | 4.27                      | 5.12                      | 5.63                      | 6.26                      | 7.04                      |
| 50                  | 3.76                      | 4.18                      | 5.02                      | 5.52                      | 6.14                      | 6.90                      |
| 51                  | 3.69                      | 4.10                      | 4.92                      | 5.41                      | 6.01                      | 6.76                      |
| 52                  | 3.62                      | 4.02                      | 4.83                      | 5.31                      | 5.90                      | 6.64                      |
| 53                  | 3.55                      | 3.95                      | 4.74                      | 5.21                      | 5.79                      | 6.51                      |
| 54                  | 3.48                      | 3.87                      | 4.65                      | 5.11                      | 5.68                      | 6.39                      |
| 55                  | 3.42                      | 3.80                      | 4.56                      | 5.02                      | 5.58                      | 6.27                      |
| 56                  | 3.36                      | 3.73                      | 4.48                      | 4.93                      | 5.48                      | 6.16                      |
| 57                  | 3.30                      | 3.67                      | 4.40                      | 4.84                      | 5.38                      | 6.05                      |
| 58                  | 3.25                      | 3.61                      | 4.33                      | 4.76                      | 5.29                      | 5.95                      |
| 59                  | 3.19                      | 3.54                      | 4.25                      | 4.68                      | 5.20                      | 5.85                      |
| 60                  | 3.14                      | 3.48                      | 4.18                      | 4.60                      | 5.11                      | 5.75                      |
| Constants           | 188.24                    | 209.15                    | 250.98                    | 276.08                    | 306.75                    | 345.10                    |

# TWIST GEARING TABLE FOR TWISTING

## TWIST GEARING TABLE

42" TWISTERS

**CYLINDER 8 INCHES DIAM. WHIRL 1½ INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 4.95

**FRONT ROLL 1½ INCHES DIAM. FRONT ROLL GEAR 112 TEETH**

| Change<br><br>Gears | TWIST PER INCH |            |            |             |             |             |
|---------------------|----------------|------------|------------|-------------|-------------|-------------|
|                     | Cyl. 70 T.     | Cyl. 60 T. | Cyl. 50 T. | Cyl. 50 T.  | Cyl. 45 T.  | Cyl. 40 T.  |
|                     | Jack 96 T.     | Jack 96 T. | Jack 96 T. | Jack 112 T. | Jack 112 T. | Jack 112 T. |
| 16                  | 10.08          | 11.77      | 14.12      | 16.47       | 18.30       | 20.59       |
| 17                  | 9.49           | 11.07      | 13.29      | 15.50       | 17.22       | 19.38       |
| 18                  | 8.96           | 10.46      | 12.55      | 14.64       | 16.27       | 18.30       |
| 19                  | 8.49           | 9.91       | 11.89      | 13.87       | 15.41       | 17.34       |
| 20                  | 8.07           | 9.41       | 11.29      | 13.18       | 14.64       | 16.47       |
| 21                  | 7.68           | 8.96       | 10.76      | 12.55       | 13.94       | 15.69       |
| 22                  | 7.33           | 8.56       | 10.27      | 11.98       | 13.31       | 14.97       |
| 23                  | 7.01           | 8.18       | 9.82       | 11.46       | 12.73       | 14.32       |
| 24                  | 6.72           | 7.84       | 9.41       | 10.98       | 12.20       | 13.73       |
| 25                  | 6.45           | 7.53       | 9.04       | 10.54       | 11.71       | 13.18       |
| 26                  | 6.21           | 7.24       | 8.69       | 10.14       | 11.26       | 12.67       |
| 27                  | 5.98           | 6.97       | 8.37       | 9.76        | 10.84       | 12.20       |
| 28                  | 5.76           | 6.72       | 8.07       | 9.41        | 10.46       | 11.76       |
| 29                  | 5.56           | 6.49       | 7.79       | 9.09        | 10.10       | 11.36       |
| 30                  | 5.38           | 6.27       | 7.53       | 8.78        | 9.76        | 10.98       |
| 31                  | 5.20           | 6.07       | 7.29       | 8.50        | 9.45        | 10.63       |
| 32                  | 5.04           | 5.88       | 7.06       | 8.24        | 9.15        | 10.29       |
| 33                  | 4.89           | 5.70       | 6.84       | 7.99        | 8.87        | 9.98        |
| 34                  | 4.75           | 5.54       | 6.64       | 7.75        | 8.61        | 9.69        |
| 35                  | 4.61           | 5.38       | 6.45       | 7.53        | 8.37        | 9.41        |
| 36                  | 4.48           | 5.23       | 6.27       | 7.32        | 8.13        | 9.15        |
| 37                  | 4.36           | 5.09       | 6.10       | 7.12        | 7.91        | 8.90        |
| 38                  | 4.25           | 4.96       | 5.94       | 6.94        | 7.71        | 8.67        |
| 39                  | 4.14           | 4.83       | 5.79       | 6.76        | 7.51        | 8.45        |
| 40                  | 4.03           | 4.71       | 5.65       | 6.59        | 7.32        | 8.24        |
| 41                  | 3.94           | 4.59       | 5.51       | 6.43        | 7.14        | 8.03        |
| 42                  | 3.84           | 4.48       | 5.38       | 6.28        | 6.97        | 7.84        |
| 43                  | 3.75           | 4.38       | 5.25       | 6.13        | 6.81        | 7.66        |
| 44                  | 3.67           | 4.28       | 5.13       | 5.99        | 6.65        | 7.49        |
| 45                  | 3.59           | 4.18       | 5.02       | 5.86        | 6.51        | 7.32        |
| 46                  | 3.51           | 4.09       | 4.91       | 5.73        | 6.37        | 7.16        |
| 47                  | 3.43           | 4.00       | 4.81       | 5.61        | 6.23        | 7.01        |
| 48                  | 3.36           | 3.92       | 4.71       | 5.49        | 6.10        | 6.87        |
| 49                  | 3.29           | 3.84       | 4.61       | 5.38        | 5.98        | 6.72        |
| 50                  | 3.23           | 3.76       | 4.52       | 5.27        | 5.86        | 6.59        |
| 51                  | 3.16           | 3.69       | 4.43       | 5.17        | 5.74        | 6.46        |
| 52                  | 3.10           | 3.62       | 4.35       | 5.07        | 5.63        | 6.34        |
| 53                  | 3.04           | 3.55       | 4.26       | 4.97        | 5.52        | 6.22        |
| 54                  | 2.99           | 3.49       | 4.18       | 4.88        | 5.42        | 6.10        |
| 55                  | 2.93           | 3.42       | 4.11       | 4.79        | 5.32        | 5.99        |
| 56                  | 2.88           | 3.36       | 4.04       | 4.71        | 5.23        | 5.88        |
| 57                  | 2.83           | 3.30       | 3.96       | 4.62        | 5.14        | 5.78        |
| 58                  | 2.78           | 3.25       | 3.89       | 4.55        | 5.05        | 5.68        |
| 59                  | 2.73           | 3.19       | 3.83       | 4.47        | 4.96        | 5.58        |
| 60                  | 2.69           | 3.14       | 3.76       | 4.39        | 4.88        | 5.49        |
| Constants           | 161.34         | 188.24     | 225.88     | 263.53      | 292.81      | 329.41      |



# TWIST GEARING TABLE FOR TWISTING

## TWIST GEARING TABLE—(Continued)

42" TWISTERS

**CYLINDER 8 INCHES DIAM. WHIRL 1½ INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 4.95

FRONT ROLL 1½ INCHES DIAM. FRONT ROLL GEAR 112 TEETH

| Change<br><br>Gears | TWIST PER INCH |             |             |             |             |             |
|---------------------|----------------|-------------|-------------|-------------|-------------|-------------|
|                     | Cyl. 40 T.     | Cyl. 36 T.  | Cyl. 30 T.  | Cyl. 30 T.  | Cyl. 27 T.  | Cyl. 24 T.  |
|                     | Jack 120 T.    | Jack 120 T. | Jack 120 T. | Jack 132 T. | Jack 132 T. | Jack 132 T. |
| 16                  | 22.06          | 24.51       | 29.41       | 32.35       | 35.95       | 40.44       |
| 17                  | 20.76          | 23.07       | 27.68       | 30.45       | 33.83       | 38.06       |
| 18                  | 19.61          | 21.79       | 26.14       | 28.76       | 31.95       | 35.95       |
| 19                  | 18.58          | 20.64       | 24.77       | 27.24       | 30.27       | 34.06       |
| 20                  | 17.65          | 19.61       | 23.53       | 25.88       | 28.76       | 32.35       |
| 21                  | 16.81          | 18.67       | 22.41       | 24.65       | 27.39       | 30.81       |
| 22                  | 16.04          | 17.83       | 21.39       | 23.53       | 26.14       | 29.41       |
| 23                  | 15.35          | 17.05       | 20.46       | 22.51       | 25.01       | 28.13       |
| 24                  | 14.71          | 16.34       | 19.61       | 21.57       | 23.97       | 26.96       |
| 25                  | 14.12          | 15.69       | 18.82       | 20.71       | 23.01       | 25.88       |
| 26                  | 13.57          | 15.08       | 18.10       | 19.91       | 22.12       | 24.89       |
| 27                  | 13.07          | 14.52       | 17.43       | 19.17       | 21.30       | 23.97       |
| 28                  | 12.61          | 14.01       | 16.81       | 18.49       | 20.54       | 23.11       |
| 29                  | 12.17          | 13.52       | 16.23       | 17.85       | 19.83       | 22.31       |
| 30                  | 11.76          | 13.07       | 15.69       | 17.26       | 19.17       | 21.57       |
| 31                  | 11.39          | 12.65       | 15.18       | 16.70       | 18.55       | 20.87       |
| 32                  | 11.03          | 12.25       | 14.71       | 16.18       | 17.97       | 20.22       |
| 33                  | 10.70          | 11.88       | 14.26       | 15.69       | 17.43       | 19.61       |
| 34                  | 10.38          | 11.53       | 13.84       | 15.23       | 16.92       | 19.03       |
| 35                  | 10.08          | 11.20       | 13.45       | 14.79       | 16.43       | 18.49       |
| 36                  | 9.80           | 10.89       | 13.07       | 14.38       | 15.98       | 17.98       |
| 37                  | 9.54           | 10.60       | 12.72       | 13.99       | 15.54       | 17.49       |
| 38                  | 9.29           | 10.32       | 12.39       | 13.62       | 15.14       | 17.03       |
| 39                  | 9.05           | 10.06       | 12.07       | 13.27       | 14.75       | 16.59       |
| 40                  | 8.82           | 9.80        | 11.76       | 12.94       | 14.38       | 16.18       |
| 41                  | 8.61           | 9.56        | 11.48       | 12.63       | 14.03       | 15.78       |
| 42                  | 8.40           | 9.34        | 11.21       | 12.33       | 13.70       | 15.41       |
| 43                  | 8.21           | 9.12        | 10.94       | 12.04       | 13.38       | 15.06       |
| 44                  | 8.02           | 8.91        | 10.70       | 11.76       | 13.07       | 14.71       |
| 45                  | 7.84           | 8.71        | 10.46       | 11.50       | 12.78       | 14.38       |
| 46                  | 7.67           | 8.52        | 10.23       | 11.25       | 12.51       | 14.07       |
| 47                  | 7.51           | 8.34        | 10.01       | 11.01       | 12.24       | 13.77       |
| 48                  | 7.35           | 8.17        | 9.81        | 10.78       | 11.99       | 13.48       |
| 49                  | 7.20           | 8.00        | 9.60        | 10.56       | 11.74       | 13.21       |
| 50                  | 7.06           | 7.84        | 9.41        | 10.35       | 11.50       | 12.94       |
| 51                  | 6.92           | 7.69        | 9.23        | 10.15       | 11.28       | 12.69       |
| 52                  | 6.79           | 7.54        | 9.05        | 9.96        | 11.06       | 12.45       |
| 53                  | 6.66           | 7.40        | 8.88        | 9.77        | 10.85       | 12.21       |
| 54                  | 6.54           | 7.26        | 8.71        | 9.59        | 10.65       | 11.98       |
| 55                  | 6.42           | 7.13        | 8.56        | 9.41        | 10.46       | 11.76       |
| 56                  | 6.30           | 7.00        | 8.41        | 9.24        | 10.27       | 11.55       |
| 57                  | 6.19           | 6.88        | 8.26        | 9.08        | 10.09       | 11.35       |
| 58                  | 6.09           | 6.76        | 8.12        | 8.93        | 9.92        | 11.16       |
| 59                  | 5.98           | 6.65        | 7.98        | 8.77        | 9.75        | 10.97       |
| 60                  | 5.88           | 6.54        | 7.84        | 8.63        | 9.59        | 10.78       |
| Constants           | 352.94         | 392.16      | 470.59      | 517.65      | 575.16      | 647.06      |

# TWIST GEARING TABLE

42" TWISTERS

CYLINDER 8 INCHES DIAM. WHIRL  $1\frac{5}{8}$  INCHES DIAM.

RATIO OF CYLINDER TO WHIRL 1 TO 4.60

FRONT ROLL  $1\frac{1}{2}$  INCHES DIAM. FRONT ROLL GEAR 112 TEETH

| Change<br><br>Gears | TWIST PER INCH |            |            |             |             |             |
|---------------------|----------------|------------|------------|-------------|-------------|-------------|
|                     | Cyl. 70 T.     | Cyl. 60 T. | Cyl. 50 T. | Cyl. 50 T.  | Cyl. 45 T.  | Cyl. 40 T.  |
|                     | Jack 96 T.     | Jack 96 T. | Jack 96 T. | Jack 112 T. | Jack 112 T. | Jack 112 T. |
| 16                  | 9.37           | 10.93      | 13.12      | 15.31       | 17.01       | 19.13       |
| 17                  | 8.82           | 10.29      | 12.35      | 14.41       | 16.01       | 18.01       |
| 18                  | 8.33           | 9.72       | 11.66      | 13.61       | 15.12       | 17.01       |
| 19                  | 7.89           | 9.21       | 11.05      | 12.89       | 14.32       | 16.11       |
| 20                  | 7.50           | 8.75       | 10.50      | 12.25       | 13.61       | 15.31       |
| 21                  | 7.14           | 8.33       | 10.00      | 11.66       | 12.96       | 14.58       |
| 22                  | 6.82           | 7.95       | 9.54       | 11.13       | 12.37       | 13.91       |
| 23                  | 6.52           | 7.61       | 9.13       | 10.65       | 11.83       | 13.31       |
| 24                  | 6.25           | 7.29       | 8.75       | 10.20       | 11.34       | 12.76       |
| 25                  | 6.00           | 7.00       | 8.40       | 9.80        | 10.88       | 12.24       |
| 26                  | 5.77           | 6.73       | 8.07       | 9.42        | 10.47       | 11.77       |
| 27                  | 5.55           | 6.48       | 7.77       | 9.07        | 10.08       | 11.34       |
| 28                  | 5.35           | 6.25       | 7.50       | 8.75        | 9.72        | 10.93       |
| 29                  | 5.17           | 6.03       | 7.24       | 8.44        | 9.38        | 10.56       |
| 30                  | 5.00           | 5.83       | 7.00       | 8.16        | 9.07        | 10.20       |
| 31                  | 4.84           | 5.64       | 6.77       | 7.90        | 8.78        | 9.87        |
| 32                  | 4.69           | 5.47       | 6.56       | 7.65        | 8.50        | 9.57        |
| 33                  | 4.54           | 5.30       | 6.36       | 7.42        | 8.25        | 9.28        |
| 34                  | 4.41           | 5.15       | 6.17       | 7.20        | 8.00        | 9.00        |
| 35                  | 4.28           | 5.00       | 6.00       | 7.00        | 7.77        | 8.75        |
| 36                  | 4.17           | 4.86       | 5.83       | 6.81        | 7.56        | 8.50        |
| 37                  | 4.05           | 4.73       | 5.67       | 6.62        | 7.35        | 8.27        |
| 38                  | 3.95           | 4.61       | 5.52       | 6.45        | 7.16        | 8.06        |
| 39                  | 3.84           | 4.49       | 5.38       | 6.28        | 6.98        | 7.85        |
| 40                  | 3.75           | 4.37       | 5.25       | 6.12        | 6.80        | 7.65        |
| 41                  | 3.66           | 4.27       | 5.12       | 5.97        | 6.64        | 7.47        |
| 42                  | 3.57           | 4.16       | 5.00       | 5.83        | 6.48        | 7.29        |
| 43                  | 3.49           | 4.07       | 4.88       | 5.70        | 6.33        | 7.12        |
| 44                  | 3.41           | 3.98       | 4.77       | 5.57        | 6.18        | 6.96        |
| 45                  | 3.33           | 3.89       | 4.66       | 5.44        | 6.05        | 6.80        |
| 46                  | 3.26           | 3.81       | 4.56       | 5.32        | 5.92        | 6.65        |
| 47                  | 3.19           | 3.72       | 4.47       | 5.21        | 5.79        | 6.51        |
| 48                  | 3.12           | 3.64       | 4.37       | 5.10        | 5.67        | 6.38        |
| 49                  | 3.06           | 3.57       | 4.28       | 5.00        | 5.55        | 6.25        |
| 50                  | 3.00           | 3.50       | 4.20       | 4.90        | 5.44        | 6.12        |
| 51                  | 2.94           | 3.43       | 4.12       | 4.80        | 5.34        | 6.00        |
| 52                  | 2.88           | 3.37       | 4.04       | 4.71        | 5.23        | 5.89        |
| 53                  | 2.83           | 3.30       | 3.96       | 4.62        | 5.13        | 5.78        |
| 54                  | 2.78           | 3.24       | 3.89       | 4.54        | 5.04        | 5.67        |
| 55                  | 2.73           | 3.18       | 3.82       | 4.45        | 4.95        | 5.57        |
| 56                  | 2.68           | 3.13       | 3.75       | 4.37        | 4.86        | 5.47        |
| 57                  | 2.63           | 3.07       | 3.68       | 4.30        | 4.77        | 5.37        |
| 58                  | 2.59           | 3.02       | 3.62       | 4.22        | 4.69        | 5.28        |
| 59                  | 2.54           | 2.96       | 3.56       | 4.15        | 4.61        | 5.19        |
| 60                  | 2.50           | 2.92       | 3.50       | 4.08        | 4.54        | 5.10        |
| Constants           | 149.94         | 174.93     | 209.91     | 244.90      | 272.11      | 306.12      |

# TWIST GEARING TABLE—(Continued)

42" TWISTERS

CYLINDER 8 INCHES DIAM. WHIRL  $1\frac{5}{8}$  INCHES DIAM.

RATIO OF CYLINDER TO WHIRL 1 TO 4.60

FRONT ROLL  $1\frac{1}{2}$  INCHES DIAM. FRONT ROLL GEAR 112 TEETH

| Change<br><br>Gears | TWIST PER INCH |             |             |             |             |             |
|---------------------|----------------|-------------|-------------|-------------|-------------|-------------|
|                     | Cyl. 40 T.     | Cyl. 36 T.  | Cyl. 30 T.  | Cyl. 30 T.  | Cyl. 27 T.  | Cyl. 24 T.  |
|                     | Jack 120 T.    | Jack 120 T. | Jack 120 T. | Jack 132 T. | Jack 132 T. | Jack 132 T. |
| 16                  | 20.50          | 22.78       | 27.33       | 30.07       | 33.41       | 37.58       |
| 17                  | 19.29          | 21.44       | 25.72       | 28.30       | 31.44       | 35.37       |
| 18                  | 18.22          | 20.25       | 24.30       | 26.73       | 29.69       | 33.41       |
| 19                  | 17.26          | 19.18       | 23.02       | 25.32       | 28.13       | 31.65       |
| 20                  | 16.40          | 18.22       | 21.87       | 24.05       | 26.73       | 30.07       |
| 21                  | 15.62          | 17.35       | 20.82       | 22.91       | 25.45       | 28.63       |
| 22                  | 14.91          | 16.57       | 19.88       | 21.87       | 24.30       | 27.33       |
| 23                  | 14.26          | 15.84       | 19.01       | 20.92       | 23.24       | 26.14       |
| 24                  | 13.67          | 15.18       | 18.22       | 20.04       | 22.27       | 25.05       |
| 25                  | 13.12          | 14.58       | 17.49       | 19.24       | 21.38       | 24.05       |
| 26                  | 12.62          | 14.02       | 16.82       | 18.50       | 20.56       | 23.13       |
| 27                  | 12.15          | 13.50       | 16.20       | 17.82       | 19.80       | 22.27       |
| 28                  | 11.71          | 13.02       | 15.62       | 17.18       | 19.09       | 21.48       |
| 29                  | 11.31          | 12.57       | 15.08       | 16.59       | 18.43       | 20.73       |
| 30                  | 10.93          | 12.15       | 14.58       | 16.04       | 17.82       | 20.04       |
| 31                  | 10.58          | 11.76       | 14.11       | 15.52       | 17.24       | 19.40       |
| 32                  | 10.25          | 11.39       | 13.67       | 15.03       | 16.70       | 18.79       |
| 33                  | 9.94           | 11.04       | 13.25       | 14.58       | 16.20       | 18.22       |
| 34                  | 9.65           | 10.72       | 12.86       | 14.15       | 15.72       | 17.69       |
| 35                  | 9.37           | 10.41       | 12.49       | 13.74       | 15.27       | 17.18       |
| 36                  | 9.11           | 10.13       | 12.15       | 13.36       | 14.85       | 16.70       |
| 37                  | 8.86           | 9.85        | 11.82       | 13.00       | 14.45       | 16.25       |
| 38                  | 8.63           | 9.59        | 11.51       | 12.66       | 14.07       | 15.83       |
| 39                  | 8.41           | 9.34        | 11.21       | 12.33       | 13.71       | 15.42       |
| 40                  | 8.20           | 9.11        | 10.93       | 12.03       | 13.36       | 15.03       |
| 41                  | 8.00           | 8.89        | 10.67       | 11.73       | 13.04       | 14.67       |
| 42                  | 7.81           | 8.68        | 10.41       | 11.46       | 12.73       | 14.32       |
| 43                  | 7.63           | 8.48        | 10.17       | 11.19       | 12.43       | 13.98       |
| 44                  | 7.45           | 8.28        | 9.94        | 10.93       | 12.15       | 13.67       |
| 45                  | 7.29           | 8.10        | 9.72        | 10.69       | 11.88       | 13.36       |
| 46                  | 7.13           | 7.92        | 9.51        | 10.46       | 11.62       | 13.07       |
| 47                  | 6.98           | 7.75        | 9.30        | 10.24       | 11.37       | 12.79       |
| 48                  | 6.83           | 7.59        | 9.11        | 10.02       | 11.14       | 12.53       |
| 49                  | 6.69           | 7.44        | 8.92        | 9.82        | 10.91       | 12.27       |
| 50                  | 6.56           | 7.29        | 8.75        | 9.62        | 10.69       | 12.03       |
| 51                  | 6.43           | 7.15        | 8.57        | 9.43        | 10.48       | 11.79       |
| 52                  | 6.31           | 7.01        | 8.41        | 9.25        | 10.28       | 11.57       |
| 53                  | 6.19           | 6.88        | 8.25        | 9.08        | 10.08       | 11.35       |
| 54                  | 6.07           | 6.75        | 8.10        | 8.91        | 9.90        | 11.14       |
| 55                  | 5.96           | 6.63        | 7.95        | 8.75        | 9.72        | 10.93       |
| 56                  | 5.86           | 6.51        | 7.81        | 8.59        | 9.55        | 10.74       |
| 57                  | 5.75           | 6.39        | 7.67        | 8.44        | 9.38        | 10.55       |
| 58                  | 5.66           | 6.29        | 7.54        | 8.29        | 9.22        | 10.37       |
| 59                  | 5.56           | 6.18        | 7.41        | 8.15        | 9.06        | 10.19       |
| 60                  | 5.47           | 6.07        | 7.29        | 8.02        | 8.91        | 10.02       |
| Constants           | 327.99         | 364.43      | 437.31      | 481.05      | 534.50      | 601.31      |

# TWIST GEARING TABLE

42" TWISTERS

**CYLINDER 8 INCHES DIAM. WHIRL  $1\frac{3}{4}$  INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 4.29

**FRONT ROLL  $1\frac{1}{2}$  INCHES DIAM. FRONT ROLL GEAR 112 TEETH**

| Change<br><br>Gears | TWIST PER INCH |            |            |             |             |             |
|---------------------|----------------|------------|------------|-------------|-------------|-------------|
|                     | Cyl. 70 T.     | Cyl. 60 T. | Cyl. 50 T. | Cyl. 50 T.  | Cyl. 45 T.  | Cyl. 40 T.  |
|                     | Jack 96 T.     | Jack 96 T. | Jack 96 T. | Jack 112 T. | Jack 112 T. | Jack 112 T. |
| 16                  | 8.74           | 10.20      | 12.24      | 14.27       | 15.86       | 17.84       |
| 17                  | 8.23           | 9.60       | 11.52      | 13.43       | 14.93       | 16.79       |
| 18                  | 7.77           | 9.06       | 10.88      | 12.69       | 14.10       | 15.86       |
| 19                  | 7.36           | 8.59       | 10.30      | 12.02       | 13.36       | 15.03       |
| 20                  | 6.99           | 8.16       | 9.79       | 11.42       | 12.69       | 14.27       |
| 21                  | 6.66           | 7.77       | 9.32       | 10.88       | 12.08       | 13.59       |
| 22                  | 6.36           | 7.42       | 8.90       | 10.38       | 11.54       | 12.98       |
| 23                  | 6.08           | 7.09       | 8.51       | 9.93        | 11.03       | 12.41       |
| 24                  | 5.83           | 6.80       | 8.16       | 9.52        | 10.57       | 11.90       |
| 25                  | 5.59           | 6.53       | 7.83       | 9.14        | 10.15       | 11.42       |
| 26                  | 5.38           | 6.27       | 7.53       | 8.78        | 9.76        | 10.98       |
| 27                  | 5.18           | 6.04       | 7.25       | 8.46        | 9.40        | 10.57       |
| 28                  | 4.99           | 5.83       | 6.99       | 8.16        | 9.06        | 10.20       |
| 29                  | 4.82           | 5.63       | 6.75       | 7.88        | 8.75        | 9.84        |
| 30                  | 4.66           | 5.44       | 6.53       | 7.61        | 8.46        | 9.52        |
| 31                  | 4.51           | 5.26       | 6.31       | 7.37        | 8.19        | 9.21        |
| 32                  | 4.37           | 5.10       | 6.12       | 7.14        | 7.93        | 8.92        |
| 33                  | 4.24           | 4.94       | 5.93       | 6.92        | 7.69        | 8.65        |
| 34                  | 4.11           | 4.80       | 5.76       | 6.72        | 7.46        | 8.40        |
| 35                  | 4.00           | 4.66       | 5.59       | 6.53        | 7.25        | 8.16        |
| 36                  | 3.88           | 4.53       | 5.44       | 6.35        | 7.05        | 7.93        |
| 37                  | 3.78           | 4.41       | 5.29       | 6.17        | 6.86        | 7.72        |
| 38                  | 3.68           | 4.29       | 5.15       | 6.01        | 6.68        | 7.52        |
| 39                  | 3.59           | 4.18       | 5.02       | 5.86        | 6.51        | 7.32        |
| 40                  | 3.50           | 4.08       | 4.89       | 5.71        | 6.34        | 7.14        |
| 41                  | 3.41           | 3.98       | 4.78       | 5.57        | 6.19        | 6.96        |
| 42                  | 3.33           | 3.89       | 4.66       | 5.44        | 6.04        | 6.80        |
| 43                  | 3.25           | 3.80       | 4.55       | 5.31        | 5.90        | 6.64        |
| 44                  | 3.18           | 3.71       | 4.45       | 5.19        | 5.77        | 6.49        |
| 45                  | 3.11           | 3.63       | 4.35       | 5.08        | 5.64        | 6.34        |
| 46                  | 3.04           | 3.55       | 4.26       | 4.97        | 5.52        | 6.21        |
| 47                  | 2.98           | 3.47       | 4.17       | 4.86        | 5.40        | 6.07        |
| 48                  | 2.91           | 3.40       | 4.08       | 4.76        | 5.29        | 5.95        |
| 49                  | 2.85           | 3.33       | 4.00       | 4.66        | 5.18        | 5.83        |
| 50                  | 2.80           | 3.26       | 3.92       | 4.57        | 5.08        | 5.71        |
| 51                  | 2.74           | 3.20       | 3.84       | 4.48        | 4.98        | 5.60        |
| 52                  | 2.69           | 3.14       | 3.76       | 4.39        | 4.88        | 5.49        |
| 53                  | 2.64           | 3.08       | 3.69       | 4.31        | 4.79        | 5.39        |
| 54                  | 2.59           | 3.02       | 3.63       | 4.23        | 4.70        | 5.29        |
| 55                  | 2.54           | 2.97       | 3.56       | 4.15        | 4.61        | 5.19        |
| 56                  | 2.50           | 2.92       | 3.50       | 4.08        | 4.53        | 5.10        |
| 57                  | 2.45           | 2.86       | 3.43       | 4.01        | 4.45        | 5.01        |
| 58                  | 2.41           | 2.81       | 3.38       | 3.94        | 4.38        | 4.92        |
| 59                  | 2.37           | 2.77       | 3.32       | 3.87        | 4.30        | 4.84        |
| 60                  | 2.33           | 2.72       | 3.26       | 3.81        | 4.23        | 4.76        |
| Constants           | 139.83         | 163.14     | 195.76     | 228.39      | 253.77      | 285.49      |

# TWIST GEARING TABLE—(Continued)

42" TWISTERS

**CYLINDER 8 INCHES DIAM. WHIRL  $1\frac{3}{4}$  INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 4.29

**FRONT ROLL  $1\frac{1}{2}$  INCHES DIAM. FRONT ROLL GEAR 112 TEETH**

| Change<br><br>Gears | TWIST PER INCH |             |             |             |             |             |
|---------------------|----------------|-------------|-------------|-------------|-------------|-------------|
|                     | Cyl. 40 T.     | Cyl. 36 T.  | Cyl. 30 T.  | Cyl. 30 T.  | Cyl. 27 T.  | Cyl. 24 T.  |
|                     | Jack 120 T.    | Jack 120 T. | Jack 120 T. | Jack 132 T. | Jack 132 T. | Jack 132 T. |
| 16                  | 19.12          | 21.24       | 25.49       | 28.04       | 31.15       | 35.05       |
| 17                  | 17.99          | 19.99       | 23.99       | 26.39       | 29.32       | 32.99       |
| 18                  | 16.99          | 18.88       | 22.66       | 24.92       | 27.69       | 31.15       |
| 19                  | 16.10          | 17.89       | 21.47       | 23.61       | 26.24       | 29.51       |
| 20                  | 15.29          | 16.99       | 20.39       | 22.43       | 24.92       | 28.04       |
| 21                  | 14.57          | 16.18       | 19.42       | 21.36       | 23.74       | 26.70       |
| 22                  | 13.90          | 15.45       | 18.54       | 20.39       | 22.66       | 25.49       |
| 23                  | 13.30          | 14.78       | 17.73       | 19.51       | 21.67       | 24.38       |
| 24                  | 12.75          | 14.16       | 16.99       | 18.69       | 20.77       | 23.37       |
| 25                  | 12.24          | 13.59       | 16.31       | 17.95       | 19.94       | 22.43       |
| 26                  | 11.76          | 13.07       | 15.69       | 17.26       | 19.17       | 21.57       |
| 27                  | 11.33          | 12.59       | 15.11       | 16.62       | 18.46       | 20.77       |
| 28                  | 10.92          | 12.14       | 14.57       | 16.02       | 17.80       | 20.03       |
| 29                  | 10.55          | 11.72       | 14.06       | 15.47       | 17.19       | 19.34       |
| 30                  | 10.20          | 11.33       | 13.59       | 14.95       | 16.62       | 18.69       |
| 31                  | 9.87           | 10.96       | 13.16       | 14.47       | 16.08       | 18.09       |
| 32                  | 9.56           | 10.62       | 12.75       | 14.02       | 15.58       | 17.52       |
| 33                  | 9.27           | 10.30       | 12.36       | 13.60       | 15.11       | 16.99       |
| 34                  | 9.00           | 10.00       | 12.00       | 13.20       | 14.66       | 16.49       |
| 35                  | 8.74           | 9.71        | 11.65       | 12.82       | 14.24       | 16.02       |
| 36                  | 8.50           | 9.44        | 11.33       | 12.46       | 13.85       | 15.58       |
| 37                  | 8.27           | 9.19        | 11.02       | 12.12       | 13.47       | 15.16       |
| 38                  | 8.05           | 8.94        | 10.73       | 11.81       | 13.12       | 14.76       |
| 39                  | 7.84           | 8.71        | 10.46       | 11.50       | 12.78       | 14.38       |
| 40                  | 7.65           | 8.50        | 10.20       | 11.22       | 12.46       | 14.02       |
| 41                  | 7.46           | 8.29        | 9.95        | 10.94       | 12.16       | 13.68       |
| 42                  | 7.28           | 8.09        | 9.71        | 10.68       | 11.87       | 13.35       |
| 43                  | 7.11           | 7.90        | 9.48        | 10.43       | 11.60       | 13.04       |
| 44                  | 6.95           | 7.72        | 9.27        | 10.20       | 11.33       | 12.75       |
| 45                  | 6.80           | 7.55        | 9.06        | 9.97        | 11.08       | 12.46       |
| 46                  | 6.65           | 7.39        | 8.87        | 9.76        | 10.84       | 12.19       |
| 47                  | 6.51           | 7.23        | 8.68        | 9.55        | 10.61       | 11.93       |
| 48                  | 6.37           | 7.08        | 8.50        | 9.35        | 10.39       | 11.68       |
| 49                  | 6.24           | 6.94        | 8.32        | 9.16        | 10.17       | 11.44       |
| 50                  | 6.12           | 6.80        | 8.16        | 8.97        | 9.97        | 11.22       |
| 51                  | 6.00           | 6.66        | 8.00        | 8.80        | 9.77        | 11.00       |
| 52                  | 5.88           | 6.54        | 7.85        | 8.63        | 9.59        | 10.79       |
| 53                  | 5.77           | 6.41        | 7.70        | 8.46        | 9.41        | 10.58       |
| 54                  | 5.66           | 6.29        | 7.55        | 8.31        | 9.23        | 10.39       |
| 55                  | 5.56           | 6.18        | 7.42        | 8.16        | 9.06        | 10.20       |
| 56                  | 5.46           | 6.07        | 7.29        | 8.01        | 8.90        | 10.02       |
| 57                  | 5.37           | 5.96        | 7.16        | 7.87        | 8.75        | 9.84        |
| 58                  | 5.27           | 5.86        | 7.03        | 7.74        | 8.60        | 9.67        |
| 59                  | 5.18           | 5.76        | 6.91        | 7.60        | 8.45        | 9.50        |
| 60                  | 5.10           | 5.66        | 6.80        | 7.48        | 8.31        | 9.35        |
| Constants           | 305.88         | 339.87      | 407.84      | 448.63      | 498.47      | 560.78      |

# TWIST GEARING TABLE

42" TWISTERS

**CYLINDER 8 INCHES DIAM. WHIRL 2 INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 3.81

**FRONT ROLL 1½ INCHES DIAM. FRONT ROLL GEAR 112 TEETH**

| Change<br><br>Gears | TWIST PER INCH |            |            |             |             |             |
|---------------------|----------------|------------|------------|-------------|-------------|-------------|
|                     | Cyl. 70 T.     | Cyl. 60 T. | Cyl. 50 T. | Cyl. 50 T.  | Cyl. 45 T.  | Cyl. 40 T.  |
|                     | Jack 96 T.     | Jack 96 T. | Jack 96 T. | Jack 112 T. | Jack 112 T. | Jack 112 T. |
| 16                  | 7.76           | 9.06       | 10.87      | 12.68       | 14.09       | 15.85       |
| 17                  | 7.31           | 8.52       | 10.23      | 11.93       | 13.26       | 14.91       |
| 18                  | 6.90           | 8.05       | 9.66       | 11.27       | 12.52       | 14.09       |
| 19                  | 6.54           | 7.63       | 9.15       | 10.68       | 11.86       | 13.34       |
| 20                  | 6.21           | 7.24       | 8.69       | 10.14       | 11.27       | 12.68       |
| 21                  | 5.91           | 6.90       | 8.28       | 9.66        | 10.73       | 12.07       |
| 22                  | 5.65           | 6.59       | 7.90       | 9.22        | 10.24       | 11.52       |
| 23                  | 5.40           | 6.30       | 7.56       | 8.82        | 9.80        | 11.02       |
| 24                  | 5.17           | 6.04       | 7.24       | 8.45        | 9.39        | 10.56       |
| 25                  | 4.97           | 5.80       | 6.95       | 8.11        | 9.02        | 10.14       |
| 26                  | 4.78           | 5.57       | 6.69       | 7.80        | 8.67        | 9.75        |
| 27                  | 4.60           | 5.37       | 6.44       | 7.51        | 8.35        | 9.39        |
| 28                  | 4.44           | 5.17       | 6.21       | 7.24        | 8.05        | 9.06        |
| 29                  | 4.28           | 5.00       | 6.00       | 6.99        | 7.77        | 8.74        |
| 30                  | 4.14           | 4.83       | 5.80       | 6.76        | 7.51        | 8.45        |
| 31                  | 4.01           | 4.67       | 5.61       | 6.54        | 7.27        | 8.18        |
| 32                  | 3.88           | 4.53       | 5.43       | 6.34        | 7.04        | 7.92        |
| 33                  | 3.76           | 4.39       | 5.27       | 6.15        | 6.83        | 7.68        |
| 34                  | 3.65           | 4.26       | 5.11       | 5.97        | 6.63        | 7.46        |
| 35                  | 3.55           | 4.14       | 4.97       | 5.80        | 6.44        | 7.24        |
| 36                  | 3.45           | 4.03       | 4.83       | 5.64        | 6.26        | 7.04        |
| 37                  | 3.36           | 3.92       | 4.70       | 5.48        | 6.09        | 6.85        |
| 38                  | 3.27           | 3.81       | 4.58       | 5.34        | 5.93        | 6.67        |
| 39                  | 3.18           | 3.71       | 4.46       | 5.20        | 5.78        | 6.50        |
| 40                  | 3.10           | 3.62       | 4.35       | 5.07        | 5.63        | 6.34        |
| 41                  | 3.03           | 3.53       | 4.24       | 4.95        | 5.50        | 6.19        |
| 42                  | 2.96           | 3.45       | 4.14       | 4.83        | 5.37        | 6.04        |
| 43                  | 2.89           | 3.37       | 4.04       | 4.72        | 5.24        | 5.90        |
| 44                  | 2.82           | 3.29       | 3.95       | 4.61        | 5.12        | 5.76        |
| 45                  | 2.76           | 3.22       | 3.86       | 4.51        | 5.01        | 5.63        |
| 46                  | 2.70           | 3.15       | 3.78       | 4.41        | 4.90        | 5.51        |
| 47                  | 2.64           | 3.08       | 3.70       | 4.32        | 4.80        | 5.39        |
| 48                  | 2.59           | 3.02       | 3.62       | 4.23        | 4.70        | 5.28        |
| 49                  | 2.53           | 2.96       | 3.55       | 4.14        | 4.60        | 5.17        |
| 50                  | 2.48           | 2.90       | 3.48       | 4.06        | 4.51        | 5.07        |
| 51                  | 2.44           | 2.84       | 3.41       | 3.98        | 4.42        | 4.97        |
| 52                  | 2.39           | 2.79       | 3.34       | 3.90        | 4.33        | 4.88        |
| 53                  | 2.34           | 2.73       | 3.28       | 3.83        | 4.25        | 4.79        |
| 54                  | 2.30           | 2.68       | 3.22       | 3.76        | 4.17        | 4.70        |
| 55                  | 2.26           | 2.63       | 3.16       | 3.69        | 4.10        | 4.61        |
| 56                  | 2.22           | 2.59       | 3.10       | 3.62        | 4.02        | 4.53        |
| 57                  | 2.18           | 2.54       | 3.05       | 3.56        | 3.95        | 4.45        |
| 58                  | 2.14           | 2.50       | 3.00       | 3.50        | 3.89        | 4.37        |
| 59                  | 2.10           | 2.46       | 2.95       | 3.44        | 3.82        | 4.30        |
| 60                  | 2.07           | 2.41       | 2.90       | 3.38        | 3.76        | 4.23        |
| Constants           | 124.19         | 144.88     | 173.86     | 202.84      | 225.38      | 253.53      |



# TWIST GEARING TABLE—(Continued)

42" TWISTERS

CYLINDER 8 INCHES DIAM. WHIRL 2 INCHES DIAM.

RATIO OF CYLINDER TO WHIRL 1 TO 3.81

FRONT ROLL 1½ INCHES DIAM. FRONT ROLL GEAR 112 TEETH

| Change<br>Gears | TWIST PER INCH            |                           |                           |                           |                           |                           |
|-----------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
|                 | Cyl. 40 T.<br>Jack 120 T. | Cyl. 36 T.<br>Jack 120 T. | Cyl. 30 T.<br>Jack 120 T. | Cyl. 30 T.<br>Jack 132 T. | Cyl. 27 T.<br>Jack 132 T. | Cyl. 24 T.<br>Jack 132 T. |
| 16              | 16.98                     | 18.87                     | 22.64                     | 24.90                     | 27.67                     | 31.13                     |
| 17              | 15.98                     | 17.76                     | 21.31                     | 23.44                     | 26.04                     | 29.30                     |
| 18              | 15.09                     | 16.77                     | 20.12                     | 22.14                     | 24.59                     | 27.67                     |
| 19              | 14.30                     | 15.89                     | 19.06                     | 20.97                     | 23.30                     | 26.21                     |
| 20              | 13.58                     | 15.09                     | 18.11                     | 19.92                     | 22.14                     | 24.90                     |
| 21              | 12.94                     | 14.37                     | 17.25                     | 18.97                     | 21.08                     | 23.72                     |
| 22              | 12.35                     | 13.72                     | 16.46                     | 18.11                     | 20.12                     | 22.64                     |
| 23              | 11.81                     | 13.12                     | 15.75                     | 17.32                     | 19.25                     | 21.65                     |
| 24              | 11.32                     | 12.58                     | 15.09                     | 16.60                     | 18.45                     | 20.75                     |
| 25              | 10.87                     | 12.07                     | 14.49                     | 15.94                     | 17.71                     | 19.92                     |
| 26              | 10.45                     | 11.61                     | 13.93                     | 15.32                     | 17.03                     | 19.16                     |
| 27              | 10.06                     | 11.18                     | 13.42                     | 14.76                     | 16.40                     | 18.45                     |
| 28              | 9.70                      | 10.78                     | 12.94                     | 14.23                     | 15.81                     | 17.79                     |
| 29              | 9.37                      | 10.41                     | 12.49                     | 13.74                     | 15.27                     | 17.17                     |
| 30              | 9.06                      | 10.06                     | 12.07                     | 13.28                     | 14.76                     | 16.60                     |
| 31              | 8.76                      | 9.74                      | 11.68                     | 12.85                     | 14.28                     | 16.07                     |
| 32              | 8.49                      | 9.43                      | 11.32                     | 12.45                     | 13.83                     | 15.56                     |
| 33              | 8.23                      | 9.15                      | 10.98                     | 12.07                     | 13.42                     | 15.09                     |
| 34              | 7.99                      | 8.88                      | 10.65                     | 11.72                     | 13.02                     | 14.65                     |
| 35              | 7.76                      | 8.62                      | 10.35                     | 11.38                     | 12.65                     | 14.23                     |
| 36              | 7.55                      | 8.39                      | 10.06                     | 11.07                     | 12.30                     | 13.83                     |
| 37              | 7.34                      | 8.16                      | 9.79                      | 10.77                     | 11.96                     | 13.46                     |
| 38              | 7.15                      | 7.95                      | 9.53                      | 10.49                     | 11.65                     | 13.11                     |
| 39              | 6.97                      | 7.74                      | 9.29                      | 10.22                     | 11.35                     | 12.77                     |
| 40              | 6.79                      | 7.55                      | 9.06                      | 9.96                      | 11.07                     | 12.45                     |
| 41              | 6.63                      | 7.36                      | 8.83                      | 9.72                      | 10.80                     | 12.15                     |
| 42              | 6.47                      | 7.19                      | 8.62                      | 9.49                      | 10.54                     | 11.86                     |
| 43              | 6.32                      | 7.02                      | 8.42                      | 9.27                      | 10.30                     | 11.58                     |
| 44              | 6.17                      | 6.86                      | 8.23                      | 9.06                      | 10.06                     | 11.32                     |
| 45              | 6.04                      | 6.71                      | 8.05                      | 8.85                      | 9.84                      | 11.07                     |
| 46              | 5.91                      | 6.56                      | 7.88                      | 8.66                      | 9.63                      | 10.83                     |
| 47              | 5.78                      | 6.42                      | 7.71                      | 8.48                      | 9.42                      | 10.60                     |
| 48              | 5.66                      | 6.29                      | 7.55                      | 8.30                      | 9.22                      | 10.38                     |
| 49              | 5.54                      | 6.16                      | 7.39                      | 8.13                      | 9.03                      | 10.16                     |
| 50              | 5.43                      | 6.04                      | 7.24                      | 7.97                      | 8.85                      | 9.96                      |
| 51              | 5.33                      | 5.92                      | 7.10                      | 7.81                      | 8.68                      | 9.77                      |
| 52              | 5.22                      | 5.81                      | 6.96                      | 7.66                      | 8.51                      | 9.58                      |
| 53              | 5.13                      | 5.70                      | 6.83                      | 7.52                      | 8.35                      | 9.40                      |
| 54              | 5.03                      | 5.59                      | 6.71                      | 7.38                      | 8.20                      | 9.22                      |
| 55              | 4.94                      | 5.49                      | 6.59                      | 7.24                      | 8.05                      | 9.06                      |
| 56              | 4.85                      | 5.39                      | 6.47                      | 7.11                      | 7.91                      | 8.90                      |
| 57              | 4.77                      | 5.30                      | 6.35                      | 6.99                      | 7.77                      | 8.74                      |
| 58              | 4.68                      | 5.21                      | 6.25                      | 6.87                      | 7.63                      | 8.59                      |
| 59              | 4.60                      | 5.12                      | 6.14                      | 6.75                      | 7.50                      | 8.44                      |
| 60              | 4.53                      | 5.03                      | 6.04                      | 6.64                      | 7.38                      | 8.30                      |
| Constants       | 271.66                    | 301.84                    | 362.21                    | 398.43                    | 442.70                    | 498.04                    |

# TWIST GEARING TABLE

42" TWISTERS

**CYLINDER 8 INCHES DIAM. WHIRL 2 $\frac{1}{4}$  INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 3.39

**FRONT ROLL 1 $\frac{1}{2}$  INCHES DIAM. FRONT ROLL GEAR 112 TEETH**

| Change<br><br>Gears | TWIST PER INCH           |                          |                          |                           |                           |                           |
|---------------------|--------------------------|--------------------------|--------------------------|---------------------------|---------------------------|---------------------------|
|                     | Cyl. 70 T.<br>Jack 96 T. | Cyl. 60 T.<br>Jack 96 T. | Cyl. 50 T.<br>Jack 96 T. | Cyl. 50 T.<br>Jack 112 T. | Cyl. 45 T.<br>Jack 112 T. | Cyl. 40 T.<br>Jack 112 T. |
| 16                  | 6.91                     | 8.06                     | 9.67                     | 11.28                     | 12.53                     | 14.10                     |
| 17                  | 6.50                     | 7.58                     | 9.10                     | 10.62                     | 11.80                     | 13.27                     |
| 18                  | 6.14                     | 7.16                     | 8.59                     | 10.03                     | 11.14                     | 12.53                     |
| 19                  | 5.82                     | 6.78                     | 8.14                     | 9.50                      | 10.55                     | 11.87                     |
| 20                  | 5.53                     | 6.45                     | 7.74                     | 9.02                      | 10.03                     | 11.28                     |
| 21                  | 5.26                     | 6.14                     | 7.37                     | 8.59                      | 9.55                      | 10.74                     |
| 22                  | 5.02                     | 5.86                     | 7.03                     | 8.20                      | 9.12                      | 10.25                     |
| 23                  | 4.80                     | 5.60                     | 6.73                     | 7.85                      | 8.72                      | 9.81                      |
| 24                  | 4.60                     | 5.37                     | 6.45                     | 7.52                      | 8.36                      | 9.40                      |
| 25                  | 4.42                     | 5.16                     | 6.19                     | 7.22                      | 8.02                      | 9.02                      |
| 26                  | 4.25                     | 4.96                     | 5.95                     | 6.94                      | 7.71                      | 8.68                      |
| 27                  | 4.09                     | 4.77                     | 5.73                     | 6.68                      | 7.43                      | 8.36                      |
| 28                  | 3.95                     | 4.60                     | 5.53                     | 6.45                      | 7.16                      | 8.06                      |
| 29                  | 3.81                     | 4.45                     | 5.33                     | 6.22                      | 6.91                      | 7.78                      |
| 30                  | 3.68                     | 4.30                     | 5.16                     | 6.02                      | 6.68                      | 7.52                      |
| 31                  | 3.56                     | 4.16                     | 4.99                     | 5.82                      | 6.47                      | 7.28                      |
| 32                  | 3.45                     | 4.03                     | 4.84                     | 5.64                      | 6.27                      | 7.05                      |
| 33                  | 3.34                     | 3.91                     | 4.69                     | 5.47                      | 6.08                      | 6.84                      |
| 34                  | 3.25                     | 3.79                     | 4.55                     | 5.31                      | 5.90                      | 6.64                      |
| 35                  | 3.16                     | 3.68                     | 4.42                     | 5.16                      | 5.73                      | 6.45                      |
| 36                  | 3.07                     | 3.58                     | 4.30                     | 5.02                      | 5.57                      | 6.27                      |
| 37                  | 2.99                     | 3.48                     | 4.18                     | 4.88                      | 5.42                      | 6.10                      |
| 38                  | 2.91                     | 3.39                     | 4.07                     | 4.75                      | 5.28                      | 5.94                      |
| 39                  | 2.83                     | 3.31                     | 3.97                     | 4.63                      | 5.14                      | 5.78                      |
| 40                  | 2.76                     | 3.23                     | 3.87                     | 4.51                      | 5.01                      | 5.64                      |
| 41                  | 2.70                     | 3.14                     | 3.77                     | 4.40                      | 4.89                      | 5.50                      |
| 42                  | 2.63                     | 3.07                     | 3.68                     | 4.30                      | 4.77                      | 5.37                      |
| 43                  | 2.57                     | 3.00                     | 3.60                     | 4.20                      | 4.66                      | 5.25                      |
| 44                  | 2.51                     | 2.93                     | 3.52                     | 4.10                      | 4.56                      | 5.13                      |
| 45                  | 2.46                     | 2.86                     | 3.44                     | 4.01                      | 4.46                      | 5.01                      |
| 46                  | 2.40                     | 2.80                     | 3.37                     | 3.93                      | 4.36                      | 4.90                      |
| 47                  | 2.35                     | 2.74                     | 3.29                     | 3.84                      | 4.27                      | 4.80                      |
| 48                  | 2.30                     | 2.69                     | 3.22                     | 3.76                      | 4.18                      | 4.70                      |
| 49                  | 2.26                     | 2.63                     | 3.16                     | 3.68                      | 4.09                      | 4.60                      |
| 50                  | 2.21                     | 2.58                     | 3.10                     | 3.61                      | 4.01                      | 4.51                      |
| 51                  | 2.17                     | 2.53                     | 3.03                     | 3.54                      | 3.93                      | 4.42                      |
| 52                  | 2.13                     | 2.48                     | 2.98                     | 3.47                      | 3.86                      | 4.34                      |
| 53                  | 2.08                     | 2.43                     | 2.92                     | 3.41                      | 3.78                      | 4.26                      |
| 54                  | 2.05                     | 2.39                     | 2.87                     | 3.34                      | 3.71                      | 4.18                      |
| 55                  | 2.01                     | 2.34                     | 2.81                     | 3.28                      | 3.65                      | 4.10                      |
| 56                  | 1.98                     | 2.30                     | 2.77                     | 3.23                      | 3.58                      | 4.03                      |
| 57                  | 1.94                     | 2.26                     | 2.72                     | 3.17                      | 3.52                      | 3.96                      |
| 58                  | 1.91                     | 2.23                     | 2.67                     | 3.11                      | 3.46                      | 3.89                      |
| 59                  | 1.87                     | 2.19                     | 2.62                     | 3.06                      | 3.40                      | 3.82                      |
| 60                  | 1.84                     | 2.15                     | 2.58                     | 3.01                      | 3.34                      | 3.76                      |
| Constants           | 110.50                   | 128.91                   | 154.70                   | 180.48                    | 200.53                    | 225.60                    |

**TWIST GEARING TABLE**—(Continued)

42" TWISTERS

**CYLINDER 8 INCHES DIAM. WHIRL 2 $\frac{1}{4}$  INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 3.39

**FRONT ROLL 1 $\frac{1}{2}$  INCHES DIAM. FRONT ROLL GEAR 112 TEETH**

| Change<br>Gears | TWIST PER INCH            |                           |                           |                           |                           |                           |
|-----------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
|                 | Cyl. 40 T.<br>Jack 120 T. | Cyl. 36 T.<br>Jack 120 T. | Cyl. 30 T.<br>Jack 120 T. | Cyl. 30 T.<br>Jack 132 T. | Cyl. 27 T.<br>Jack 132 T. | Cyl. 24 T.<br>Jack 132 T. |
| 16              | 15.11                     | 16.79                     | 20.14                     | 22.16                     | 24.62                     | 27.70                     |
| 17              | 14.22                     | 15.80                     | 18.96                     | 20.85                     | 23.17                     | 26.07                     |
| 18              | 13.43                     | 14.92                     | 17.91                     | 19.70                     | 21.88                     | 24.62                     |
| 19              | 12.72                     | 14.14                     | 16.96                     | 18.66                     | 20.73                     | 23.32                     |
| 20              | 12.09                     | 13.43                     | 16.11                     | 17.73                     | 19.70                     | 22.16                     |
| 21              | 11.51                     | 12.79                     | 15.35                     | 16.88                     | 18.76                     | 21.10                     |
| 22              | 10.99                     | 12.21                     | 14.65                     | 16.11                     | 17.90                     | 20.14                     |
| 23              | 10.51                     | 11.68                     | 14.01                     | 15.41                     | 17.13                     | 19.27                     |
| 24              | 10.07                     | 11.19                     | 13.43                     | 14.77                     | 16.41                     | 18.46                     |
| 25              | 9.67                      | 10.74                     | 12.89                     | 14.18                     | 15.76                     | 17.73                     |
| 26              | 9.30                      | 10.33                     | 12.40                     | 13.64                     | 15.15                     | 17.04                     |
| 27              | 8.95                      | 9.95                      | 11.94                     | 13.13                     | 14.59                     | 16.41                     |
| 28              | 8.63                      | 9.59                      | 11.51                     | 12.66                     | 14.07                     | 15.83                     |
| 29              | 8.33                      | 9.26                      | 11.11                     | 12.22                     | 13.58                     | 15.28                     |
| 30              | 8.06                      | 8.95                      | 10.74                     | 11.82                     | 13.13                     | 14.77                     |
| 31              | 7.80                      | 8.66                      | 10.40                     | 11.44                     | 12.71                     | 14.29                     |
| 32              | 7.56                      | 8.40                      | 10.07                     | 11.08                     | 12.31                     | 13.85                     |
| 33              | 7.32                      | 8.14                      | 9.77                      | 10.74                     | 11.94                     | 13.43                     |
| 34              | 7.11                      | 7.90                      | 9.48                      | 10.43                     | 11.59                     | 13.04                     |
| 35              | 6.91                      | 7.67                      | 9.21                      | 10.13                     | 11.25                     | 12.66                     |
| 36              | 6.72                      | 7.46                      | 8.95                      | 9.85                      | 10.94                     | 12.31                     |
| 37              | 6.53                      | 7.26                      | 8.71                      | 9.58                      | 10.65                     | 11.98                     |
| 38              | 6.36                      | 7.07                      | 8.48                      | 9.33                      | 10.37                     | 11.66                     |
| 39              | 6.20                      | 6.89                      | 8.26                      | 9.09                      | 10.10                     | 11.36                     |
| 40              | 6.05                      | 6.72                      | 8.06                      | 8.87                      | 9.85                      | 11.08                     |
| 41              | 5.90                      | 6.55                      | 7.86                      | 8.65                      | 9.61                      | 10.81                     |
| 42              | 5.76                      | 6.40                      | 7.68                      | 8.44                      | 9.38                      | 10.55                     |
| 43              | 5.62                      | 6.25                      | 7.50                      | 8.24                      | 9.16                      | 10.31                     |
| 44              | 5.49                      | 6.10                      | 7.33                      | 8.06                      | 8.95                      | 10.07                     |
| 45              | 5.37                      | 5.97                      | 7.16                      | 7.88                      | 8.75                      | 9.85                      |
| 46              | 5.25                      | 5.84                      | 7.01                      | 7.71                      | 8.56                      | 9.64                      |
| 47              | 5.14                      | 5.71                      | 6.86                      | 7.54                      | 8.38                      | 9.43                      |
| 48              | 5.04                      | 5.60                      | 6.72                      | 7.39                      | 8.21                      | 9.23                      |
| 49              | 4.93                      | 5.48                      | 6.58                      | 7.24                      | 8.04                      | 9.04                      |
| 50              | 4.84                      | 5.37                      | 6.45                      | 7.09                      | 7.88                      | 8.87                      |
| 51              | 4.74                      | 5.27                      | 6.32                      | 6.95                      | 7.72                      | 8.69                      |
| 52              | 4.65                      | 5.17                      | 6.20                      | 6.82                      | 7.58                      | 8.52                      |
| 53              | 4.56                      | 5.07                      | 6.08                      | 6.69                      | 7.43                      | 8.36                      |
| 54              | 4.48                      | 4.98                      | 5.97                      | 6.57                      | 7.29                      | 8.21                      |
| 55              | 4.39                      | 4.88                      | 5.86                      | 6.45                      | 7.16                      | 8.06                      |
| 56              | 4.32                      | 4.80                      | 5.76                      | 6.33                      | 7.04                      | 7.92                      |
| 57              | 4.24                      | 4.71                      | 5.65                      | 6.22                      | 6.91                      | 7.77                      |
| 58              | 4.17                      | 4.63                      | 5.56                      | 6.11                      | 6.79                      | 7.64                      |
| 59              | 4.10                      | 4.55                      | 5.46                      | 6.01                      | 6.68                      | 7.51                      |
| 60              | 4.03                      | 4.48                      | 5.37                      | 5.91                      | 6.57                      | 7.39                      |
| Constants       | 241.71                    | 268.57                    | 322.29                    | 354.51                    | 393.90                    | 443.14                    |

# TWIST GEARING TABLE

42" TWISTERS

**CYLINDER 8 INCHES DIAM. WHIRL 2½ INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 3.02

**FRONT ROLL 1½ INCHES DIAM. FRONT ROLL GEAR 112 TEETH**

| Change<br><br>Gears | TWIST PER INCH |            |            |             |             |             |
|---------------------|----------------|------------|------------|-------------|-------------|-------------|
|                     | Cyl. 70 T.     | Cyl. 60 T. | Cyl. 50 T. | Cyl. 50 T.  | Cyl. 45 T.  | Cyl. 40 T.  |
|                     | Jack 96 T.     | Jack 96 T. | Jack 96 T. | Jack 112 T. | Jack 112 T. | Jack 112 T. |
| 16                  | 6.15           | 7.18       | 8.61       | 10.05       | 11.17       | 12.56       |
| 17                  | 5.79           | 6.76       | 8.11       | 9.46        | 10.51       | 11.82       |
| 18                  | 5.47           | 6.38       | 7.66       | 8.93        | 9.92        | 11.17       |
| 19                  | 5.18           | 6.04       | 7.25       | 8.46        | 9.40        | 10.58       |
| 20                  | 4.92           | 5.74       | 6.89       | 8.04        | 8.93        | 10.05       |
| 21                  | 4.69           | 5.47       | 6.56       | 7.66        | 8.51        | 9.57        |
| 22                  | 4.47           | 5.22       | 6.26       | 7.31        | 8.12        | 9.14        |
| 23                  | 4.28           | 4.99       | 5.99       | 6.99        | 7.77        | 8.74        |
| 24                  | 4.10           | 4.79       | 5.74       | 6.70        | 7.44        | 8.37        |
| 25                  | 3.94           | 4.59       | 5.51       | 6.43        | 7.15        | 8.04        |
| 26                  | 3.79           | 4.42       | 5.30       | 6.18        | 6.87        | 7.73        |
| 27                  | 3.65           | 4.25       | 5.10       | 5.95        | 6.62        | 7.44        |
| 28                  | 3.52           | 4.10       | 4.92       | 5.74        | 6.38        | 7.18        |
| 29                  | 3.39           | 3.96       | 4.75       | 5.54        | 6.16        | 6.93        |
| 30                  | 3.28           | 3.83       | 4.59       | 5.36        | 5.95        | 6.70        |
| 31                  | 3.18           | 3.70       | 4.45       | 5.19        | 5.76        | 6.48        |
| 32                  | 3.08           | 3.59       | 4.31       | 5.02        | 5.58        | 6.28        |
| 33                  | 2.98           | 3.48       | 4.18       | 4.87        | 5.41        | 6.09        |
| 34                  | 2.90           | 3.38       | 4.05       | 4.73        | 5.25        | 5.91        |
| 35                  | 2.81           | 3.28       | 3.94       | 4.59        | 5.10        | 5.74        |
| 36                  | 2.73           | 3.19       | 3.84       | 4.47        | 4.96        | 5.58        |
| 37                  | 2.66           | 3.10       | 3.73       | 4.35        | 4.83        | 5.43        |
| 38                  | 2.59           | 3.02       | 3.63       | 4.23        | 4.70        | 5.29        |
| 39                  | 2.53           | 2.94       | 3.53       | 4.12        | 4.58        | 5.15        |
| 40                  | 2.46           | 2.87       | 3.45       | 4.02        | 4.47        | 5.02        |
| 41                  | 2.40           | 2.80       | 3.36       | 3.92        | 4.36        | 4.90        |
| 42                  | 2.34           | 2.73       | 3.28       | 3.83        | 4.25        | 4.79        |
| 43                  | 2.29           | 2.67       | 3.20       | 3.74        | 4.15        | 4.67        |
| 44                  | 2.24           | 2.61       | 3.13       | 3.65        | 4.06        | 4.57        |
| 45                  | 2.19           | 2.55       | 3.06       | 3.57        | 3.97        | 4.47        |
| 46                  | 2.14           | 2.50       | 3.00       | 3.49        | 3.88        | 4.37        |
| 47                  | 2.09           | 2.44       | 2.93       | 3.42        | 3.80        | 4.28        |
| 48                  | 2.05           | 2.39       | 2.87       | 3.35        | 3.72        | 4.19        |
| 49                  | 2.01           | 2.34       | 2.81       | 3.28        | 3.65        | 4.10        |
| 50                  | 1.97           | 2.30       | 2.76       | 3.22        | 3.57        | 4.02        |
| 51                  | 1.93           | 2.25       | 2.70       | 3.15        | 3.50        | 3.94        |
| 52                  | 1.89           | 2.21       | 2.65       | 3.09        | 3.44        | 3.86        |
| 53                  | 1.86           | 2.17       | 2.60       | 3.03        | 3.37        | 3.79        |
| 54                  | 1.82           | 2.13       | 2.55       | 2.98        | 3.31        | 3.72        |
| 55                  | 1.79           | 2.09       | 2.50       | 2.92        | 3.25        | 3.65        |
| 56                  | 1.76           | 2.05       | 2.46       | 2.87        | 3.19        | 3.59        |
| 57                  | 1.73           | 2.01       | 2.42       | 2.82        | 3.13        | 3.53        |
| 58                  | 1.70           | 1.98       | 2.38       | 2.77        | 3.08        | 3.47        |
| 59                  | 1.67           | 1.95       | 2.34       | 2.73        | 3.03        | 3.41        |
| 60                  | 1.64           | 1.91       | 2.30       | 2.68        | 2.98        | 3.35        |
| Constants           | 98.44          | 114.84     | 137.81     | 160.78      | 178.64      | 200.97      |

# TWIST GEARING TABLE—(Continued)

## 42" TWISTERS

**CYLINDER 8 INCHES DIAM. WHIRL 2½ INCHES DIAM.**  
 RATIO OF CYLINDER TO WHIRL 1 TO 3.02

**FRONT ROLL 1½ INCHES DIAM. FRONT ROLL GEAR 112 TEETH**

| Change<br><br>Gears | TWIST PER INCH |             |             |             |             |             |
|---------------------|----------------|-------------|-------------|-------------|-------------|-------------|
|                     | Cyl. 40 T.     | Cyl. 36 T.  | Cyl. 30 T.  | Cyl. 30 T.  | Cyl. 27 T.  | Cyl. 24 T.  |
|                     | Jack 120 T.    | Jack 120 T. | Jack 120 T. | Jack 132 T. | Jack 132 T. | Jack 132 T. |
| 16                  | 13.46          | 14.95       | 17.94       | 19.74       | 21.93       | 24.67       |
| 17                  | 12.67          | 14.07       | 16.89       | 18.58       | 20.64       | 23.22       |
| 18                  | 11.96          | 13.29       | 15.95       | 17.55       | 19.50       | 21.93       |
| 19                  | 11.33          | 12.59       | 15.11       | 16.62       | 18.47       | 20.78       |
| 20                  | 10.77          | 11.96       | 14.36       | 15.79       | 17.55       | 19.74       |
| 21                  | 10.25          | 11.39       | 13.67       | 15.04       | 16.71       | 18.80       |
| 22                  | 9.79           | 10.88       | 13.05       | 14.36       | 15.95       | 17.94       |
| 23                  | 9.36           | 10.40       | 12.48       | 13.73       | 15.26       | 17.16       |
| 24                  | 8.97           | 9.97        | 11.96       | 13.16       | 14.62       | 16.45       |
| 25                  | 8.61           | 9.57        | 11.48       | 12.63       | 14.04       | 15.79       |
| 26                  | 8.28           | 9.20        | 11.04       | 12.15       | 13.50       | 15.18       |
| 27                  | 7.98           | 8.86        | 10.63       | 11.70       | 13.00       | 14.62       |
| 28                  | 7.69           | 8.55        | 10.25       | 11.28       | 12.53       | 14.10       |
| 29                  | 7.43           | 8.25        | 9.90        | 10.89       | 12.10       | 13.61       |
| 30                  | 7.18           | 7.98        | 9.57        | 10.53       | 11.70       | 13.16       |
| 31                  | 6.95           | 7.72        | 9.26        | 10.19       | 11.32       | 12.73       |
| 32                  | 6.73           | 7.48        | 8.97        | 9.87        | 10.97       | 12.34       |
| 33                  | 6.53           | 7.25        | 8.70        | 9.57        | 10.63       | 11.96       |
| 34                  | 6.34           | 7.04        | 8.45        | 9.29        | 10.32       | 11.61       |
| 35                  | 6.15           | 6.84        | 8.20        | 9.02        | 10.03       | 11.28       |
| 36                  | 5.98           | 6.65        | 7.98        | 8.78        | 9.75        | 10.97       |
| 37                  | 5.82           | 6.47        | 7.76        | 8.54        | 9.48        | 10.67       |
| 38                  | 5.67           | 6.30        | 7.56        | 8.31        | 9.24        | 10.39       |
| 39                  | 5.52           | 6.13        | 7.36        | 8.10        | 9.00        | 10.12       |
| 40                  | 5.39           | 5.98        | 7.18        | 7.90        | 8.78        | 9.87        |
| 41                  | 5.25           | 5.84        | 7.00        | 7.70        | 8.56        | 9.62        |
| 42                  | 5.13           | 5.70        | 6.84        | 7.52        | 8.36        | 9.40        |
| 43                  | 5.01           | 5.56        | 6.68        | 7.34        | 8.16        | 9.18        |
| 44                  | 4.90           | 5.44        | 6.53        | 7.18        | 7.98        | 8.97        |
| 45                  | 4.79           | 5.32        | 6.38        | 7.02        | 7.80        | 8.77        |
| 46                  | 4.68           | 5.20        | 6.24        | 6.87        | 7.63        | 8.58        |
| 47                  | 4.58           | 5.09        | 6.11        | 6.72        | 7.47        | 8.40        |
| 48                  | 4.49           | 4.99        | 5.98        | 6.58        | 7.31        | 8.23        |
| 49                  | 4.39           | 4.88        | 5.86        | 6.45        | 7.16        | 8.06        |
| 50                  | 4.31           | 4.79        | 5.74        | 6.32        | 7.02        | 7.90        |
| 51                  | 4.22           | 4.69        | 5.63        | 6.19        | 6.88        | 7.74        |
| 52                  | 4.14           | 4.60        | 5.52        | 6.08        | 6.75        | 7.59        |
| 53                  | 4.06           | 4.52        | 5.42        | 5.96        | 6.62        | 7.45        |
| 54                  | 3.99           | 4.43        | 5.32        | 5.85        | 6.50        | 7.31        |
| 55                  | 3.92           | 4.35        | 5.22        | 5.74        | 6.38        | 7.18        |
| 56                  | 3.85           | 4.28        | 5.13        | 5.64        | 6.27        | 7.05        |
| 57                  | 3.78           | 4.20        | 5.04        | 5.54        | 6.16        | 6.93        |
| 58                  | 3.72           | 4.13        | 4.95        | 5.45        | 6.05        | 6.81        |
| 59                  | 3.65           | 4.06        | 4.87        | 5.35        | 5.95        | 6.69        |
| 60                  | 3.59           | 3.99        | 4.79        | 5.26        | 5.85        | 6.58        |
| Constants           | 215.33         | 239.26      | 287.11      | 315.82      | 350.91      | 394.77      |

# TWIST GEARING TABLE

42" TWISTERS

**GROOVED PULLEY 6 IN. DIAM. WHIRL 1½ INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 3.57

**FRONT ROLL 1½ INCHES DIAM. FRONT ROLL GEAR 112 TEETH**

| Change<br>Gears | TWIST PER INCH           |                          |                          |                           |                           |                           |
|-----------------|--------------------------|--------------------------|--------------------------|---------------------------|---------------------------|---------------------------|
|                 | Cyl. 70 T.<br>Jack 96 T. | Cyl. 60 T.<br>Jack 96 T. | Cyl. 50 T.<br>Jack 96 T. | Cyl. 50 T.<br>Jack 112 T. | Cyl. 45 T.<br>Jack 112 T. | Cyl. 40 T.<br>Jack 112 T. |
| 16              | 7.27                     | 8.49                     | 10.18                    | 11.88                     | 13.20                     | 14.85                     |
| 17              | 6.84                     | 7.99                     | 9.58                     | 11.18                     | 12.42                     | 13.98                     |
| 18              | 6.46                     | 7.54                     | 9.05                     | 10.56                     | 11.73                     | 13.20                     |
| 19              | 6.12                     | 7.15                     | 8.57                     | 10.00                     | 11.11                     | 12.50                     |
| 20              | 5.82                     | 6.79                     | 8.15                     | 9.50                      | 10.56                     | 11.88                     |
| 21              | 5.54                     | 6.46                     | 7.76                     | 9.05                      | 10.06                     | 11.31                     |
| 22              | 5.29                     | 6.17                     | 7.41                     | 8.64                      | 9.60                      | 10.80                     |
| 23              | 5.06                     | 5.90                     | 7.08                     | 8.26                      | 9.18                      | 10.33                     |
| 24              | 4.85                     | 5.66                     | 6.79                     | 7.92                      | 8.80                      | 9.90                      |
| 25              | 4.65                     | 5.43                     | 6.52                     | 7.60                      | 8.45                      | 9.50                      |
| 26              | 4.48                     | 5.22                     | 6.27                     | 7.31                      | 8.12                      | 9.14                      |
| 27              | 4.31                     | 5.03                     | 6.03                     | 7.04                      | 7.82                      | 8.80                      |
| 28              | 4.16                     | 4.85                     | 5.82                     | 6.79                      | 7.54                      | 8.49                      |
| 29              | 4.01                     | 4.68                     | 5.62                     | 6.55                      | 7.28                      | 8.19                      |
| 30              | 3.88                     | 4.53                     | 5.43                     | 6.34                      | 7.04                      | 7.92                      |
| 31              | 3.75                     | 4.38                     | 5.26                     | 6.13                      | 6.81                      | 7.66                      |
| 32              | 3.64                     | 4.24                     | 5.09                     | 5.94                      | 6.60                      | 7.42                      |
| 33              | 3.53                     | 4.11                     | 4.94                     | 5.76                      | 6.40                      | 7.20                      |
| 34              | 3.42                     | 3.99                     | 4.79                     | 5.59                      | 6.21                      | 6.99                      |
| 35              | 3.32                     | 3.88                     | 4.65                     | 5.43                      | 6.03                      | 6.79                      |
| 36              | 3.23                     | 3.77                     | 4.53                     | 5.28                      | 5.87                      | 6.60                      |
| 37              | 3.14                     | 3.67                     | 4.40                     | 5.14                      | 5.71                      | 6.42                      |
| 38              | 3.06                     | 3.57                     | 4.29                     | 5.00                      | 5.56                      | 6.25                      |
| 39              | 2.98                     | 3.48                     | 4.18                     | 4.87                      | 5.41                      | 6.09                      |
| 40              | 2.91                     | 3.39                     | 4.07                     | 4.75                      | 5.28                      | 5.94                      |
| 41              | 2.84                     | 3.31                     | 3.97                     | 4.64                      | 5.15                      | 5.79                      |
| 42              | 2.77                     | 3.23                     | 3.88                     | 4.53                      | 5.03                      | 5.65                      |
| 43              | 2.71                     | 3.16                     | 3.79                     | 4.42                      | 4.91                      | 5.53                      |
| 44              | 2.64                     | 3.09                     | 3.70                     | 4.32                      | 4.80                      | 5.40                      |
| 45              | 2.59                     | 3.02                     | 3.62                     | 4.22                      | 4.69                      | 5.28                      |
| 46              | 2.53                     | 2.95                     | 3.54                     | 4.13                      | 4.59                      | 5.16                      |
| 47              | 2.48                     | 2.89                     | 3.47                     | 4.04                      | 4.49                      | 5.05                      |
| 48              | 2.42                     | 2.83                     | 3.39                     | 3.96                      | 4.40                      | 4.95                      |
| 49              | 2.37                     | 2.77                     | 3.32                     | 3.88                      | 4.31                      | 4.85                      |
| 50              | 2.33                     | 2.72                     | 3.26                     | 3.80                      | 4.22                      | 4.75                      |
| 51              | 2.28                     | 2.66                     | 3.19                     | 3.73                      | 4.14                      | 4.66                      |
| 52              | 2.24                     | 2.61                     | 3.13                     | 3.66                      | 4.06                      | 4.57                      |
| 53              | 2.20                     | 2.56                     | 3.07                     | 3.59                      | 3.98                      | 4.48                      |
| 54              | 2.15                     | 2.51                     | 3.02                     | 3.52                      | 3.91                      | 4.40                      |
| 55              | 2.12                     | 2.47                     | 2.96                     | 3.46                      | 3.84                      | 4.32                      |
| 56              | 2.08                     | 2.43                     | 2.91                     | 3.39                      | 3.77                      | 4.24                      |
| 57              | 2.04                     | 2.38                     | 2.86                     | 3.33                      | 3.70                      | 4.17                      |
| 58              | 2.01                     | 2.34                     | 2.81                     | 3.28                      | 3.64                      | 4.10                      |
| 59              | 1.97                     | 2.30                     | 2.76                     | 3.22                      | 3.58                      | 4.03                      |
| 60              | 1.94                     | 2.26                     | 2.72                     | 3.17                      | 3.52                      | 3.96                      |
| Constants       | 116.36                   | 135.76                   | 162.91                   | 190.06                    | 211.18                    | 237.58                    |



# TWIST GEARING TABLE FOR TWISTING

## TWIST GEARING TABLE—(Continued)

42" TWISTERS

**GROOVED PULLEY 6 IN. DIAM. WHIRL 1½ INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 3.57

**FRONT ROLL 1½ INCHES DIAM. FRONT ROLL GEAR 112 TEETH**

| Change<br>Gears | TWIST PER INCH |             |             |             |             |             |
|-----------------|----------------|-------------|-------------|-------------|-------------|-------------|
|                 | Cyl. 40 T.     | Cyl. 36 T.  | Cyl. 30 T.  | Cyl. 30 T.  | Cyl. 27 T.  | Cyl. 24 T.  |
|                 | Jack 120 T.    | Jack 120 T. | Jack 120 T. | Jack 132 T. | Jack 132 T. | Jack 132 T. |
| 16              | 15.91          | 17.68       | 21.21       | 23.33       | 25.93       | 29.17       |
| 17              | 14.97          | 16.64       | 19.96       | 21.96       | 24.40       | 27.45       |
| 18              | 14.14          | 15.71       | 18.86       | 20.74       | 23.05       | 25.93       |
| 19              | 13.40          | 14.89       | 17.86       | 19.65       | 21.83       | 24.56       |
| 20              | 12.73          | 14.14       | 16.97       | 18.67       | 20.74       | 23.33       |
| 21              | 12.12          | 13.47       | 16.16       | 17.78       | 19.76       | 22.22       |
| 22              | 11.57          | 12.86       | 15.43       | 16.97       | 18.86       | 21.21       |
| 23              | 11.07          | 12.30       | 14.76       | 16.23       | 18.04       | 20.29       |
| 24              | 10.61          | 11.78       | 14.14       | 15.56       | 17.28       | 19.44       |
| 25              | 10.18          | 11.31       | 13.58       | 14.93       | 16.59       | 18.67       |
| 26              | 9.79           | 10.88       | 13.05       | 14.36       | 15.95       | 17.95       |
| 27              | 9.43           | 10.48       | 12.57       | 13.83       | 15.36       | 17.28       |
| 28              | 9.09           | 10.10       | 12.12       | 13.33       | 14.81       | 16.67       |
| 29              | 8.78           | 9.75        | 11.70       | 12.87       | 14.30       | 16.09       |
| 30              | 8.49           | 9.43        | 11.31       | 12.44       | 13.83       | 15.56       |
| 31              | 8.21           | 9.12        | 10.95       | 12.04       | 13.38       | 15.05       |
| 32              | 7.95           | 8.84        | 10.61       | 11.67       | 12.96       | 14.58       |
| 33              | 7.71           | 8.57        | 10.28       | 11.31       | 12.57       | 14.14       |
| 34              | 7.49           | 8.32        | 9.98        | 10.98       | 12.20       | 13.73       |
| 35              | 7.27           | 8.08        | 9.70        | 10.67       | 11.85       | 13.33       |
| 36              | 7.07           | 7.86        | 9.43        | 10.37       | 11.53       | 12.96       |
| 37              | 6.88           | 7.64        | 9.17        | 10.09       | 11.21       | 12.61       |
| 38              | 6.70           | 7.44        | 8.93        | 9.82        | 10.92       | 12.28       |
| 39              | 6.53           | 7.25        | 8.70        | 9.57        | 10.64       | 11.97       |
| 40              | 6.36           | 7.07        | 8.48        | 9.33        | 10.37       | 11.67       |
| 41              | 6.21           | 6.90        | 8.28        | 9.11        | 10.12       | 11.38       |
| 42              | 6.06           | 6.73        | 8.08        | 8.89        | 9.88        | 11.11       |
| 43              | 5.92           | 6.58        | 7.89        | 8.68        | 9.65        | 10.85       |
| 44              | 5.79           | 6.43        | 7.71        | 8.48        | 9.43        | 10.61       |
| 45              | 5.66           | 6.29        | 7.54        | 8.30        | 9.22        | 10.37       |
| 46              | 5.53           | 6.15        | 7.38        | 8.12        | 9.02        | 10.14       |
| 47              | 5.42           | 6.02        | 7.22        | 7.94        | 8.83        | 9.93        |
| 48              | 5.30           | 5.89        | 7.07        | 7.78        | 8.64        | 9.72        |
| 49              | 5.19           | 5.77        | 6.93        | 7.62        | 8.47        | 9.52        |
| 50              | 5.09           | 5.66        | 6.79        | 7.47        | 8.30        | 9.33        |
| 51              | 4.99           | 5.55        | 6.65        | 7.32        | 8.13        | 9.15        |
| 52              | 4.89           | 5.44        | 6.53        | 7.18        | 7.98        | 8.97        |
| 53              | 4.80           | 5.34        | 6.40        | 7.04        | 7.83        | 8.81        |
| 54              | 4.71           | 5.24        | 6.29        | 6.91        | 7.68        | 8.64        |
| 55              | 4.63           | 5.14        | 6.17        | 6.79        | 7.54        | 8.48        |
| 56              | 4.55           | 5.05        | 6.06        | 6.67        | 7.41        | 8.33        |
| 57              | 4.47           | 4.96        | 5.95        | 6.55        | 7.28        | 8.19        |
| 58              | 4.39           | 4.88        | 5.85        | 6.44        | 7.15        | 8.05        |
| 59              | 4.31           | 4.79        | 5.75        | 6.33        | 7.03        | 7.91        |
| 60              | 4.24           | 4.71        | 5.66        | 6.22        | 6.91        | 7.78        |
| Constants       | 254.55         | 282.83      | 339.39      | 373.33      | 414.81      | 466.67      |

# TWIST GEARING TABLE FOR TWISTING

## TWIST GEARING TABLE

42" TWISTERS

**GROOVED PULLEY 6 IN. DIAM. WHIRL  $1\frac{5}{8}$  INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 3.32

**FRONT ROLL  $1\frac{1}{2}$  INCHES DIAM. FRONT ROLL GEAR 112 TEETH**

| Change<br><br>Gears | TWIST PER INCH |            |            |             |             |             |
|---------------------|----------------|------------|------------|-------------|-------------|-------------|
|                     | Cyl. 70 T.     | Cyl. 60 T. | Cyl. 50 T. | Cyl. 50 T.  | Cyl. 45 T.  | Cyl. 40 T.  |
|                     | Jack 96 T.     | Jack 96 T. | Jack 96 T. | Jack 112 T. | Jack 112 T. | Jack 112 T. |
| 16                  | 6.76           | 7.89       | 9.47       | 11.05       | 12.27       | 13.81       |
| 17                  | 6.37           | 7.43       | 8.91       | 10.40       | 11.55       | 13.00       |
| 18                  | 6.01           | 7.01       | 8.42       | 9.82        | 10.91       | 12.27       |
| 19                  | 5.70           | 6.64       | 7.97       | 9.30        | 10.34       | 11.63       |
| 20                  | 5.41           | 6.31       | 7.58       | 8.84        | 9.82        | 11.05       |
| 21                  | 5.15           | 6.01       | 7.21       | 8.42        | 9.35        | 10.52       |
| 22                  | 4.92           | 5.74       | 6.89       | 8.03        | 8.93        | 10.04       |
| 23                  | 4.70           | 5.49       | 6.59       | 7.68        | 8.54        | 9.61        |
| 24                  | 4.51           | 5.26       | 6.31       | 7.36        | 8.18        | 9.21        |
| 25                  | 4.33           | 5.05       | 6.06       | 7.07        | 7.86        | 8.84        |
| 26                  | 4.16           | 4.86       | 5.83       | 6.80        | 7.55        | 8.50        |
| 27                  | 4.01           | 4.68       | 5.61       | 6.55        | 7.27        | 8.18        |
| 28                  | 3.86           | 4.51       | 5.41       | 6.31        | 7.01        | 7.89        |
| 29                  | 3.73           | 4.35       | 5.22       | 6.09        | 6.77        | 7.62        |
| 30                  | 3.61           | 4.21       | 5.05       | 5.89        | 6.55        | 7.36        |
| 31                  | 3.49           | 4.07       | 4.89       | 5.70        | 6.34        | 7.13        |
| 32                  | 3.38           | 3.95       | 4.73       | 5.52        | 6.14        | 6.90        |
| 33                  | 3.28           | 3.83       | 4.59       | 5.36        | 5.95        | 6.70        |
| 34                  | 3.18           | 3.71       | 4.46       | 5.20        | 5.78        | 6.50        |
| 35                  | 3.09           | 3.61       | 4.33       | 5.05        | 5.61        | 6.31        |
| 36                  | 3.01           | 3.51       | 4.21       | 4.91        | 5.46        | 6.14        |
| 37                  | 2.92           | 3.41       | 4.10       | 4.78        | 5.31        | 5.97        |
| 38                  | 2.85           | 3.32       | 3.99       | 4.65        | 5.17        | 5.81        |
| 39                  | 2.77           | 3.24       | 3.88       | 4.53        | 5.04        | 5.67        |
| 40                  | 2.71           | 3.16       | 3.79       | 4.42        | 4.91        | 5.52        |
| 41                  | 2.64           | 3.08       | 3.70       | 4.31        | 4.79        | 5.39        |
| 42                  | 2.58           | 3.01       | 3.61       | 4.21        | 4.68        | 5.26        |
| 43                  | 2.52           | 2.94       | 3.52       | 4.11        | 4.57        | 5.14        |
| 44                  | 2.46           | 2.87       | 3.44       | 4.02        | 4.46        | 5.02        |
| 45                  | 2.40           | 2.81       | 3.37       | 3.93        | 4.36        | 4.91        |
| 46                  | 2.35           | 2.75       | 3.30       | 3.84        | 4.27        | 4.80        |
| 47                  | 2.30           | 2.69       | 3.22       | 3.76        | 4.18        | 4.70        |
| 48                  | 2.25           | 2.63       | 3.16       | 3.68        | 4.09        | 4.60        |
| 49                  | 2.21           | 2.58       | 3.09       | 3.61        | 4.01        | 4.51        |
| 50                  | 2.16           | 2.53       | 3.03       | 3.54        | 3.93        | 4.42        |
| 51                  | 2.12           | 2.48       | 2.97       | 3.47        | 3.85        | 4.33        |
| 52                  | 2.08           | 2.43       | 2.92       | 3.40        | 3.78        | 4.25        |
| 53                  | 2.04           | 2.38       | 2.86       | 3.33        | 3.71        | 4.17        |
| 54                  | 2.00           | 2.34       | 2.81       | 3.27        | 3.64        | 4.09        |
| 55                  | 1.97           | 2.30       | 2.75       | 3.21        | 3.57        | 4.02        |
| 56                  | 1.93           | 2.25       | 2.71       | 3.16        | 3.51        | 3.95        |
| 57                  | 1.90           | 2.21       | 2.66       | 3.10        | 3.45        | 3.88        |
| 58                  | 1.87           | 2.18       | 2.61       | 3.05        | 3.39        | 3.81        |
| 59                  | 1.83           | 2.14       | 2.57       | 3.00        | 3.33        | 3.74        |
| 60                  | 1.80           | 2.10       | 2.53       | 2.95        | 3.27        | 3.68        |
| Constants           | 108.21         | 126.25     | 151.50     | 176.75      | 196.39      | 220.94      |

# TWIST GEARING TABLE —(Continued)

42" TWISTERS

**GROOVED PULLEY 6 IN. DIAM. WHIRL  $1\frac{5}{8}$  INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 3.32

**FRONT ROLL  $1\frac{1}{2}$  INCHES DIAM. FRONT ROLL GEAR 112 TEETH**

| Change<br><br>Gears | TWIST PER INCH |             |             |             |             |             |
|---------------------|----------------|-------------|-------------|-------------|-------------|-------------|
|                     | Cyl. 40 T.     | Cyl. 36 T.  | Cyl. 30 T.  | Cyl. 30 T.  | Cyl. 27 T.  | Cyl. 24 T.  |
|                     | Jack 120 T.    | Jack 120 T. | Jack 120 T. | Jack 132 T. | Jack 132 T. | Jack 132 T. |
| 16                  | 14.80          | 16.44       | 19.73       | 21.70       | 24.11       | 27.12       |
| 17                  | 13.92          | 15.47       | 18.57       | 20.42       | 22.69       | 25.53       |
| 18                  | 13.15          | 14.61       | 17.54       | 19.29       | 21.43       | 24.11       |
| 19                  | 12.46          | 13.84       | 16.61       | 18.27       | 20.30       | 22.84       |
| 20                  | 11.84          | 13.15       | 15.78       | 17.36       | 19.29       | 21.70       |
| 21                  | 11.27          | 12.52       | 15.03       | 16.53       | 18.37       | 20.67       |
| 22                  | 10.76          | 11.96       | 14.35       | 15.78       | 17.53       | 19.73       |
| 23                  | 10.29          | 11.44       | 13.72       | 15.10       | 16.77       | 18.87       |
| 24                  | 9.86           | 10.96       | 13.15       | 14.47       | 16.07       | 18.08       |
| 25                  | 9.47           | 10.52       | 12.63       | 13.89       | 15.43       | 17.36       |
| 26                  | 9.10           | 10.12       | 12.14       | 13.35       | 14.84       | 16.69       |
| 27                  | 8.77           | 9.74        | 11.69       | 12.86       | 14.29       | 16.07       |
| 28                  | 8.45           | 9.39        | 11.27       | 12.40       | 13.78       | 15.50       |
| 29                  | 8.16           | 9.07        | 10.88       | 11.97       | 13.30       | 14.97       |
| 30                  | 7.89           | 8.77        | 10.52       | 11.57       | 12.86       | 14.47       |
| 31                  | 7.64           | 8.48        | 10.18       | 11.20       | 12.44       | 14.00       |
| 32                  | 7.40           | 8.22        | 9.86        | 10.85       | 12.06       | 13.56       |
| 33                  | 7.17           | 7.97        | 9.56        | 10.52       | 11.69       | 13.15       |
| 34                  | 6.96           | 7.74        | 9.28        | 10.21       | 11.35       | 12.76       |
| 35                  | 6.76           | 7.51        | 9.02        | 9.92        | 11.02       | 12.40       |
| 36                  | 6.58           | 7.31        | 8.77        | 9.65        | 10.72       | 12.06       |
| 37                  | 6.40           | 7.11        | 8.53        | 9.38        | 10.43       | 11.73       |
| 38                  | 6.23           | 6.92        | 8.31        | 9.14        | 10.15       | 11.42       |
| 39                  | 6.07           | 6.74        | 8.09        | 8.90        | 9.89        | 11.13       |
| 40                  | 5.92           | 6.58        | 7.89        | 8.68        | 9.64        | 10.85       |
| 41                  | 5.77           | 6.42        | 7.70        | 8.47        | 9.41        | 10.59       |
| 42                  | 5.64           | 6.26        | 7.52        | 8.27        | 9.19        | 10.33       |
| 43                  | 5.51           | 6.12        | 7.34        | 8.07        | 8.97        | 10.09       |
| 44                  | 5.38           | 5.98        | 7.17        | 7.89        | 8.77        | 9.86        |
| 45                  | 5.26           | 5.84        | 7.01        | 7.72        | 8.57        | 9.64        |
| 46                  | 5.15           | 5.72        | 6.86        | 7.55        | 8.39        | 9.43        |
| 47                  | 5.04           | 5.60        | 6.72        | 7.39        | 8.21        | 9.23        |
| 48                  | 4.93           | 5.48        | 6.58        | 7.24        | 8.04        | 9.04        |
| 49                  | 4.83           | 5.37        | 6.44        | 7.09        | 7.87        | 8.86        |
| 50                  | 4.73           | 5.26        | 6.31        | 6.94        | 7.72        | 8.68        |
| 51                  | 4.64           | 5.16        | 6.19        | 6.81        | 7.56        | 8.51        |
| 52                  | 4.55           | 5.06        | 6.07        | 6.68        | 7.42        | 8.35        |
| 53                  | 4.47           | 4.96        | 5.96        | 6.55        | 7.28        | 8.19        |
| 54                  | 4.38           | 4.87        | 5.85        | 6.43        | 7.14        | 8.04        |
| 55                  | 4.30           | 4.78        | 5.74        | 6.31        | 7.01        | 7.89        |
| 56                  | 4.23           | 4.70        | 5.64        | 6.20        | 6.89        | 7.75        |
| 57                  | 4.15           | 4.61        | 5.54        | 6.09        | 6.77        | 7.61        |
| 58                  | 4.08           | 4.53        | 5.44        | 5.99        | 6.65        | 7.48        |
| 59                  | 4.01           | 4.46        | 5.35        | 5.88        | 6.54        | 7.36        |
| 60                  | 3.95           | 4.38        | 5.26        | 5.79        | 6.43        | 7.23        |
| Constants           | 236.72         | 263.02      | 315.63      | 347.19      | 385.77      | 433.99      |

# TWIST GEARING TABLE

42" TWISTERS

**GROOVED PULLEY 6 IN. DIAM. WHIRL  $1\frac{3}{4}$  INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 3.12

**FRONT ROLL  $1\frac{1}{2}$  INCHES DIAM. FRONT ROLL GEAR 112 TEETH**

| Change<br><br>Gears | TWIST PER INCH |            |            |             |             |             |
|---------------------|----------------|------------|------------|-------------|-------------|-------------|
|                     | Cyl. 70 T.     | Cyl. 60 T. | Cyl. 50 T. | Cyl. 50 T.  | Cyl. 45 T.  | Cyl. 40 T.  |
|                     | Jack 96 T.     | Jack 96 T. | Jack 96 T. | Jack 112 T. | Jack 112 T. | Jack 112 T. |
| 16                  | 6.36           | 7.42       | 8.90       | 10.38       | 11.54       | 12.98       |
| 17                  | 5.98           | 6.98       | 8.37       | 9.77        | 10.86       | 12.21       |
| 18                  | 5.65           | 6.59       | 7.91       | 9.23        | 10.25       | 11.54       |
| 19                  | 5.35           | 6.24       | 7.49       | 8.74        | 9.71        | 10.93       |
| 20                  | 5.09           | 5.93       | 7.12       | 8.31        | 9.23        | 10.38       |
| 21                  | 4.84           | 5.65       | 6.78       | 7.91        | 8.79        | 9.89        |
| 22                  | 4.62           | 5.39       | 6.47       | 7.55        | 8.39        | 9.44        |
| 23                  | 4.42           | 5.16       | 6.19       | 7.22        | 8.02        | 9.03        |
| 24                  | 4.24           | 4.94       | 5.93       | 6.92        | 7.69        | 8.65        |
| 25                  | 4.07           | 4.75       | 5.69       | 6.64        | 7.38        | 8.31        |
| 26                  | 3.91           | 4.56       | 5.48       | 6.39        | 7.10        | 7.99        |
| 27                  | 3.77           | 4.39       | 5.27       | 6.15        | 6.84        | 7.69        |
| 28                  | 3.63           | 4.24       | 5.08       | 5.93        | 6.59        | 7.42        |
| 29                  | 3.51           | 4.09       | 4.91       | 5.73        | 6.36        | 7.16        |
| 30                  | 3.39           | 3.96       | 4.75       | 5.54        | 6.15        | 6.92        |
| 31                  | 3.28           | 3.83       | 4.59       | 5.36        | 5.95        | 6.70        |
| 32                  | 3.18           | 3.71       | 4.45       | 5.19        | 5.77        | 6.49        |
| 33                  | 3.08           | 3.60       | 4.31       | 5.03        | 5.59        | 6.29        |
| 34                  | 2.99           | 3.49       | 4.19       | 4.89        | 5.43        | 6.11        |
| 35                  | 2.91           | 3.39       | 4.07       | 4.75        | 5.27        | 5.93        |
| 36                  | 2.83           | 3.30       | 3.96       | 4.62        | 5.13        | 5.77        |
| 37                  | 2.75           | 3.21       | 3.85       | 4.49        | 4.99        | 5.61        |
| 38                  | 2.68           | 3.12       | 3.75       | 4.37        | 4.86        | 5.46        |
| 39                  | 2.61           | 3.04       | 3.65       | 4.26        | 4.73        | 5.32        |
| 40                  | 2.54           | 2.97       | 3.56       | 4.15        | 4.61        | 5.19        |
| 41                  | 2.48           | 2.89       | 3.47       | 4.05        | 4.50        | 5.06        |
| 42                  | 2.42           | 2.82       | 3.39       | 3.95        | 4.39        | 4.94        |
| 43                  | 2.37           | 2.76       | 3.31       | 3.86        | 4.29        | 4.83        |
| 44                  | 2.31           | 2.70       | 3.24       | 3.78        | 4.19        | 4.72        |
| 45                  | 2.26           | 2.64       | 3.16       | 3.69        | 4.10        | 4.61        |
| 46                  | 2.21           | 2.58       | 3.10       | 3.61        | 4.01        | 4.51        |
| 47                  | 2.16           | 2.52       | 3.03       | 3.53        | 3.93        | 4.42        |
| 48                  | 2.12           | 2.47       | 2.97       | 3.46        | 3.85        | 4.33        |
| 49                  | 2.08           | 2.42       | 2.91       | 3.39        | 3.77        | 4.24        |
| 50                  | 2.03           | 2.37       | 2.85       | 3.32        | 3.69        | 4.15        |
| 51                  | 1.99           | 2.33       | 2.79       | 3.26        | 3.62        | 4.07        |
| 52                  | 1.96           | 2.28       | 2.74       | 3.20        | 3.55        | 3.99        |
| 53                  | 1.92           | 2.24       | 2.69       | 3.13        | 3.48        | 3.92        |
| 54                  | 1.88           | 2.20       | 2.64       | 3.08        | 3.42        | 3.85        |
| 55                  | 1.85           | 2.16       | 2.59       | 3.02        | 3.36        | 3.78        |
| 56                  | 1.82           | 2.12       | 2.54       | 2.97        | 3.30        | 3.71        |
| 57                  | 1.78           | 2.08       | 2.50       | 2.91        | 3.24        | 3.64        |
| 58                  | 1.75           | 2.05       | 2.46       | 2.86        | 3.18        | 3.58        |
| 59                  | 1.72           | 2.01       | 2.41       | 2.82        | 3.13        | 3.52        |
| 60                  | 1.70           | 1.98       | 2.37       | 2.77        | 3.08        | 3.46        |
| Constants           | 101.70         | 118.65     | 142.37     | 166.10      | 184.56      | 207.63      |

# TWIST GEARING TABLE FOR TWISTING

## TWIST GEARING TABLE—(Continued)

42" TWISTERS

**GROOVED PULLEY 6 IN. DIAM. WHIRL  $1\frac{3}{4}$  INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 3.12

**FRONT ROLL  $1\frac{1}{2}$  INCHES DIAM. FRONT ROLL GEAR 112 TEETH**

| Change<br><br>Gears | TWIST PER INCH |             |             |             |             |             |
|---------------------|----------------|-------------|-------------|-------------|-------------|-------------|
|                     | Cyl. 40 T.     | Cyl. 36 T.  | Cyl. 30 T.  | Cyl. 30 T.  | Cyl. 27 T.  | Cyl. 24 T.  |
|                     | Jack 120 T.    | Jack 120 T. | Jack 120 T. | Jack 132 T. | Jack 132 T. | Jack 132 T. |
| 16                  | 13.90          | 15.45       | 18.54       | 20.39       | 22.66       | 25.49       |
| 17                  | 13.09          | 14.54       | 17.45       | 19.19       | 21.33       | 23.99       |
| 18                  | 12.36          | 13.73       | 16.48       | 18.13       | 20.14       | 22.66       |
| 19                  | 11.71          | 13.01       | 15.61       | 17.17       | 19.08       | 21.47       |
| 20                  | 11.12          | 12.36       | 14.83       | 16.31       | 18.13       | 20.39       |
| 21                  | 10.59          | 11.77       | 14.12       | 15.54       | 17.26       | 19.42       |
| 22                  | 10.11          | 11.24       | 13.48       | 14.83       | 16.48       | 18.54       |
| 23                  | 9.67           | 10.75       | 12.90       | 14.19       | 15.76       | 17.73       |
| 24                  | 9.27           | 10.30       | 12.36       | 13.59       | 15.11       | 16.99       |
| 25                  | 8.90           | 9.89        | 11.86       | 13.05       | 14.50       | 16.31       |
| 26                  | 8.56           | 9.51        | 11.41       | 12.55       | 13.94       | 15.69       |
| 27                  | 8.24           | 9.15        | 10.99       | 12.08       | 13.43       | 15.11       |
| 28                  | 7.95           | 8.83        | 10.59       | 11.65       | 12.95       | 14.56       |
| 29                  | 7.67           | 8.52        | 10.23       | 11.25       | 12.50       | 14.06       |
| 30                  | 7.42           | 8.24        | 9.89        | 10.88       | 12.08       | 13.59       |
| 31                  | 7.18           | 7.97        | 9.57        | 10.52       | 11.69       | 13.16       |
| 32                  | 6.95           | 7.72        | 9.27        | 10.20       | 11.33       | 12.75       |
| 33                  | 6.74           | 7.49        | 8.99        | 9.89        | 10.99       | 12.36       |
| 34                  | 6.54           | 7.27        | 8.72        | 9.60        | 10.66       | 12.00       |
| 35                  | 6.36           | 7.06        | 8.47        | 9.32        | 10.36       | 11.65       |
| 36                  | 6.18           | 6.87        | 8.24        | 9.07        | 10.07       | 11.33       |
| 37                  | 6.01           | 6.68        | 8.02        | 8.82        | 9.80        | 11.02       |
| 38                  | 5.85           | 6.50        | 7.81        | 8.59        | 9.54        | 10.73       |
| 39                  | 5.70           | 6.34        | 7.61        | 8.37        | 9.30        | 10.46       |
| 40                  | 5.56           | 6.18        | 7.42        | 8.16        | 9.06        | 10.20       |
| 41                  | 5.43           | 6.03        | 7.23        | 7.96        | 8.84        | 9.95        |
| 42                  | 5.30           | 5.89        | 7.06        | 7.77        | 8.63        | 9.71        |
| 43                  | 5.17           | 5.75        | 6.90        | 7.59        | 8.43        | 9.48        |
| 44                  | 5.06           | 5.62        | 6.74        | 7.42        | 8.24        | 9.27        |
| 45                  | 4.94           | 5.49        | 6.59        | 7.25        | 8.06        | 9.06        |
| 46                  | 4.84           | 5.37        | 6.45        | 7.09        | 7.88        | 8.86        |
| 47                  | 4.73           | 5.26        | 6.31        | 6.94        | 7.71        | 8.68        |
| 48                  | 4.63           | 5.15        | 6.18        | 6.80        | 7.55        | 8.50        |
| 49                  | 4.54           | 5.04        | 6.05        | 6.66        | 7.40        | 8.32        |
| 50                  | 4.45           | 4.94        | 5.93        | 6.53        | 7.25        | 8.16        |
| 51                  | 4.36           | 4.85        | 5.82        | 6.40        | 7.11        | 8.00        |
| 52                  | 4.28           | 4.75        | 5.70        | 6.28        | 6.97        | 7.84        |
| 53                  | 4.20           | 4.66        | 5.60        | 6.16        | 6.84        | 7.70        |
| 54                  | 4.12           | 4.58        | 5.49        | 6.04        | 6.71        | 7.55        |
| 55                  | 4.04           | 4.49        | 5.39        | 5.93        | 6.59        | 7.42        |
| 56                  | 3.97           | 4.41        | 5.30        | 5.83        | 6.47        | 7.28        |
| 57                  | 3.90           | 4.34        | 5.20        | 5.72        | 6.36        | 7.16        |
| 58                  | 3.84           | 4.26        | 5.12        | 5.62        | 6.25        | 7.03        |
| 59                  | 3.77           | 4.19        | 5.03        | 5.53        | 6.14        | 6.91        |
| 60                  | 3.71           | 4.12        | 4.94        | 5.44        | 6.04        | 6.80        |
| Constants           | 222.46         | 247.18      | 296.61      | 326.27      | 362.53      | 407.84      |

# TWIST GEARING TABLE

42" TWISTERS

GROOVED PULLEY 6 IN. DIAM. WHIRL 2 INCHES DIAM.

RATIO OF CYLINDER TO WHIRL 1 TO 2.77

FRONT ROLL  $1\frac{1}{2}$  INCHES DIAM. FRONT ROLL GEAR 112 TEETH

| Change<br>Gears | TWIST PER INCH |            |            |             |             |             |
|-----------------|----------------|------------|------------|-------------|-------------|-------------|
|                 | Cyl. 70 T.     | Cyl. 60 T. | Cyl. 50 T. | Cyl. 50 T.  | Cyl. 45 T.  | Cyl. 40 T.  |
|                 | Jack 96 T.     | Jack 96 T. | Jack 96 T. | Jack 112 T. | Jack 112 T. | Jack 112 T. |
| 16              | 5.64           | 6.58       | 7.90       | 9.22        | 10.24       | 11.52       |
| 17              | 5.31           | 6.20       | 7.44       | 8.67        | 9.64        | 10.84       |
| 18              | 5.02           | 5.85       | 7.02       | 8.19        | 9.10        | 10.24       |
| 19              | 4.75           | 5.54       | 6.65       | 7.76        | 8.62        | 9.70        |
| 20              | 4.51           | 5.27       | 6.32       | 7.37        | 8.19        | 9.22        |
| 21              | 4.30           | 5.02       | 6.02       | 7.02        | 7.80        | 8.78        |
| 22              | 4.10           | 4.79       | 5.75       | 6.70        | 7.45        | 8.38        |
| 23              | 3.93           | 4.58       | 5.50       | 6.41        | 7.12        | 8.01        |
| 24              | 3.76           | 4.39       | 5.27       | 6.14        | 6.83        | 7.68        |
| 25              | 3.61           | 4.21       | 5.06       | 5.90        | 6.55        | 7.37        |
| 26              | 3.47           | 4.05       | 4.86       | 5.67        | 6.30        | 7.09        |
| 27              | 3.34           | 3.90       | 4.68       | 5.46        | 6.07        | 6.83        |
| 28              | 3.22           | 3.76       | 4.51       | 5.27        | 5.85        | 6.58        |
| 29              | 3.11           | 3.63       | 4.36       | 5.09        | 5.65        | 6.36        |
| 30              | 3.01           | 3.51       | 4.21       | 4.92        | 5.46        | 6.14        |
| 31              | 2.91           | 3.40       | 4.08       | 4.76        | 5.29        | 5.95        |
| 32              | 2.82           | 3.29       | 3.95       | 4.61        | 5.12        | 5.76        |
| 33              | 2.74           | 3.19       | 3.83       | 4.47        | 4.97        | 5.59        |
| 34              | 2.66           | 3.10       | 3.72       | 4.34        | 4.82        | 5.42        |
| 35              | 2.58           | 3.01       | 3.61       | 4.21        | 4.68        | 5.27        |
| 36              | 2.51           | 2.93       | 3.51       | 4.10        | 4.55        | 5.12        |
| 37              | 2.44           | 2.85       | 3.42       | 3.99        | 4.43        | 4.98        |
| 38              | 2.38           | 2.77       | 3.33       | 3.88        | 4.31        | 4.85        |
| 39              | 2.32           | 2.70       | 3.24       | 3.78        | 4.20        | 4.73        |
| 40              | 2.26           | 2.63       | 3.16       | 3.69        | 4.10        | 4.61        |
| 41              | 2.20           | 2.57       | 3.08       | 3.60        | 4.00        | 4.50        |
| 42              | 2.15           | 2.51       | 3.01       | 3.51        | 3.90        | 4.39        |
| 43              | 2.10           | 2.45       | 2.94       | 3.43        | 3.81        | 4.29        |
| 44              | 2.05           | 2.39       | 2.87       | 3.35        | 3.72        | 4.19        |
| 45              | 2.01           | 2.34       | 2.81       | 3.28        | 3.64        | 4.10        |
| 46              | 1.96           | 2.29       | 2.75       | 3.21        | 3.56        | 4.01        |
| 47              | 1.92           | 2.24       | 2.69       | 3.14        | 3.49        | 3.92        |
| 48              | 1.88           | 2.19       | 2.63       | 3.07        | 3.41        | 3.84        |
| 49              | 1.84           | 2.15       | 2.58       | 3.01        | 3.34        | 3.76        |
| 50              | 1.81           | 2.11       | 2.53       | 2.95        | 3.28        | 3.69        |
| 51              | 1.77           | 2.07       | 2.48       | 2.89        | 3.21        | 3.61        |
| 52              | 1.74           | 2.03       | 2.43       | 2.84        | 3.15        | 3.55        |
| 53              | 1.70           | 1.99       | 2.38       | 2.78        | 3.09        | 3.48        |
| 54              | 1.67           | 1.95       | 2.34       | 2.73        | 3.03        | 3.41        |
| 55              | 1.64           | 1.92       | 2.30       | 2.68        | 2.98        | 3.35        |
| 56              | 1.61           | 1.88       | 2.26       | 2.63        | 2.93        | 3.29        |
| 57              | 1.58           | 1.85       | 2.22       | 2.59        | 2.87        | 3.23        |
| 58              | 1.56           | 1.82       | 2.18       | 2.54        | 2.83        | 3.18        |
| 59              | 1.53           | 1.79       | 2.14       | 2.50        | 2.78        | 3.12        |
| 60              | 1.50           | 1.76       | 2.11       | 2.46        | 2.73        | 3.07        |
| Constants       | 90.29          | 105.34     | 126.40     | 147.47      | 163.86      | 184.34      |



# TWIST GEARING TABLE—(Continued)

42" TWISTERS

GROOVED PULLEY 6 IN. DIAM. WHIRL 2 INCHES DIAM.

RATIO OF CYLINDER TO WHIRL 1 TO 2.77

FRONT ROLL  $1\frac{1}{2}$  INCHES DIAM. FRONT ROLL GEAR 112 TEETH

| Change<br>Gears | TWIST PER INCH            |                           |                           |                           |                           |                           |
|-----------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
|                 | Cyl. 40 T.<br>Jack 120 T. | Cyl. 36 T.<br>Jack 120 T. | Cyl. 30 T.<br>Jack 120 T. | Cyl. 30 T.<br>Jack 132 T. | Cyl. 27 T.<br>Jack 132 T. | Cyl. 24 T.<br>Jack 132 T. |
| 16              | 12.34                     | 13.72                     | 16.46                     | 18.10                     | 20.12                     | 22.63                     |
| 17              | 11.62                     | 12.91                     | 15.49                     | 17.04                     | 18.93                     | 21.30                     |
| 18              | 10.97                     | 12.19                     | 14.63                     | 16.09                     | 17.88                     | 20.12                     |
| 19              | 10.39                     | 11.55                     | 13.86                     | 15.25                     | 16.94                     | 19.06                     |
| 20              | 9.88                      | 10.97                     | 13.17                     | 14.48                     | 16.09                     | 18.10                     |
| 21              | 9.40                      | 10.45                     | 12.54                     | 13.79                     | 15.33                     | 17.24                     |
| 22              | 8.98                      | 9.98                      | 11.97                     | 13.17                     | 14.63                     | 16.46                     |
| 23              | 8.59                      | 9.54                      | 11.45                     | 12.59                     | 13.99                     | 15.74                     |
| 24              | 8.23                      | 9.14                      | 10.97                     | 12.07                     | 13.41                     | 15.09                     |
| 25              | 7.90                      | 8.78                      | 10.53                     | 11.59                     | 12.87                     | 14.48                     |
| 26              | 7.60                      | 8.44                      | 10.13                     | 11.14                     | 12.38                     | 13.93                     |
| 27              | 7.31                      | 8.13                      | 9.75                      | 10.73                     | 11.92                     | 13.41                     |
| 28              | 7.05                      | 7.84                      | 9.41                      | 10.35                     | 11.50                     | 12.93                     |
| 29              | 6.81                      | 7.57                      | 9.08                      | 9.99                      | 11.10                     | 12.49                     |
| 30              | 6.58                      | 7.32                      | 8.78                      | 9.66                      | 10.73                     | 12.07                     |
| 31              | 6.37                      | 7.08                      | 8.49                      | 9.34                      | 10.38                     | 11.68                     |
| 32              | 6.17                      | 6.86                      | 8.23                      | 9.05                      | 10.06                     | 11.32                     |
| 33              | 5.98                      | 6.65                      | 7.98                      | 8.78                      | 9.75                      | 10.97                     |
| 34              | 5.81                      | 6.45                      | 7.75                      | 8.52                      | 9.47                      | 10.65                     |
| 35              | 5.64                      | 6.27                      | 7.52                      | 8.28                      | 9.20                      | 10.35                     |
| 36              | 5.49                      | 6.10                      | 7.32                      | 8.05                      | 8.94                      | 10.06                     |
| 37              | 5.34                      | 5.93                      | 7.12                      | 7.83                      | 8.70                      | 9.79                      |
| 38              | 5.20                      | 5.78                      | 6.93                      | 7.63                      | 8.47                      | 9.53                      |
| 39              | 5.06                      | 5.63                      | 6.75                      | 7.43                      | 8.25                      | 9.28                      |
| 40              | 4.94                      | 5.49                      | 6.58                      | 7.24                      | 8.05                      | 9.05                      |
| 41              | 4.82                      | 5.35                      | 6.42                      | 7.07                      | 7.85                      | 8.83                      |
| 42              | 4.70                      | 5.23                      | 6.27                      | 6.90                      | 7.67                      | 8.62                      |
| 43              | 4.59                      | 5.10                      | 6.12                      | 6.74                      | 7.49                      | 8.42                      |
| 44              | 4.49                      | 4.99                      | 5.98                      | 6.58                      | 7.32                      | 8.23                      |
| 45              | 4.39                      | 4.88                      | 5.85                      | 6.44                      | 7.15                      | 8.05                      |
| 46              | 4.29                      | 4.77                      | 5.72                      | 6.30                      | 7.00                      | 7.87                      |
| 47              | 4.20                      | 4.67                      | 5.60                      | 6.16                      | 6.85                      | 7.70                      |
| 48              | 4.11                      | 4.57                      | 5.49                      | 6.03                      | 6.71                      | 7.54                      |
| 49              | 4.03                      | 4.48                      | 5.37                      | 5.91                      | 6.57                      | 7.39                      |
| 50              | 3.95                      | 4.39                      | 5.27                      | 5.79                      | 6.44                      | 7.24                      |
| 51              | 3.87                      | 4.31                      | 5.17                      | 5.68                      | 6.31                      | 7.10                      |
| 52              | 3.80                      | 4.22                      | 5.06                      | 5.57                      | 6.19                      | 6.96                      |
| 53              | 3.73                      | 4.14                      | 4.97                      | 5.47                      | 6.07                      | 6.83                      |
| 54              | 3.66                      | 4.06                      | 4.88                      | 5.36                      | 5.96                      | 6.71                      |
| 55              | 3.59                      | 3.99                      | 4.79                      | 5.27                      | 5.85                      | 6.58                      |
| 56              | 3.53                      | 3.92                      | 4.71                      | 5.18                      | 5.75                      | 6.47                      |
| 57              | 3.46                      | 3.85                      | 4.62                      | 5.08                      | 5.65                      | 6.35                      |
| 58              | 3.41                      | 3.79                      | 4.54                      | 4.99                      | 5.55                      | 6.24                      |
| 59              | 3.35                      | 3.72                      | 4.46                      | 4.91                      | 5.46                      | 6.14                      |
| 60              | 3.29                      | 3.66                      | 4.39                      | 4.83                      | 5.36                      | 6.03                      |
| Constants       | 197.50                    | 219.45                    | 263.33                    | 289.67                    | 321.86                    | 362.09                    |

**TWIST GEARING TABLE**

42" TWISTERS

**GROOVED PULLEY 6 IN. DIAM. WHIRL 2 $\frac{1}{4}$  INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 2.49

**FRONT ROLL 1 $\frac{1}{2}$  INCHES DIAM. FRONT ROLL GEAR 112 TEETH**

| Change<br><br>Gears | TWIST PER INCH |            |            |             |             |             |
|---------------------|----------------|------------|------------|-------------|-------------|-------------|
|                     | Cyl. 70 T.     | Cyl. 60 T. | Cyl. 50 T. | Cyl. 50 T.  | Cyl. 45 T.  | Cyl. 40 T.  |
|                     | Jack 96 T.     | Jack 96 T. | Jack 96 T. | Jack 112 T. | Jack 112 T. | Jack 112 T. |
| 16                  | 5.07           | 5.92       | 7.10       | 8.29        | 9.21        | 10.36       |
| 17                  | 4.77           | 5.57       | 6.68       | 7.80        | 8.66        | 9.75        |
| 18                  | 4.51           | 5.26       | 6.31       | 7.36        | 8.18        | 9.21        |
| 19                  | 4.27           | 4.98       | 5.98       | 6.98        | 7.75        | 8.72        |
| 20                  | 4.06           | 4.73       | 5.68       | 6.63        | 7.36        | 8.29        |
| 21                  | 3.86           | 4.51       | 5.41       | 6.31        | 7.01        | 7.89        |
| 22                  | 3.69           | 4.30       | 5.17       | 6.03        | 6.70        | 7.53        |
| 23                  | 3.53           | 4.11       | 4.94       | 5.76        | 6.40        | 7.20        |
| 24                  | 3.38           | 3.95       | 4.73       | 5.52        | 6.14        | 6.90        |
| 25                  | 3.25           | 3.79       | 4.55       | 5.30        | 5.89        | 6.63        |
| 26                  | 3.12           | 3.64       | 4.37       | 5.10        | 5.67        | 6.37        |
| 27                  | 3.01           | 3.51       | 4.21       | 4.91        | 5.46        | 6.14        |
| 28                  | 2.90           | 3.38       | 4.06       | 4.73        | 5.26        | 5.92        |
| 29                  | 2.80           | 3.27       | 3.92       | 4.57        | 5.08        | 5.71        |
| 30                  | 2.71           | 3.15       | 3.79       | 4.42        | 4.91        | 5.52        |
| 31                  | 2.62           | 3.05       | 3.66       | 4.28        | 4.75        | 5.35        |
| 32                  | 2.54           | 2.96       | 3.55       | 4.15        | 4.61        | 5.18        |
| 33                  | 2.46           | 2.87       | 3.44       | 4.02        | 4.46        | 5.02        |
| 34                  | 2.39           | 2.79       | 3.34       | 3.90        | 4.33        | 4.87        |
| 35                  | 2.32           | 2.71       | 3.25       | 3.79        | 4.21        | 4.73        |
| 36                  | 2.26           | 2.63       | 3.16       | 3.68        | 4.09        | 4.60        |
| 37                  | 2.19           | 2.56       | 3.07       | 3.58        | 3.98        | 4.48        |
| 38                  | 2.14           | 2.49       | 2.99       | 3.49        | 3.88        | 4.36        |
| 39                  | 2.08           | 2.43       | 2.91       | 3.40        | 3.78        | 4.25        |
| 40                  | 2.03           | 2.37       | 2.84       | 3.31        | 3.68        | 4.14        |
| 41                  | 1.98           | 2.31       | 2.77       | 3.23        | 3.59        | 4.04        |
| 42                  | 1.93           | 2.26       | 2.71       | 3.16        | 3.51        | 3.95        |
| 43                  | 1.89           | 2.20       | 2.64       | 3.08        | 3.43        | 3.85        |
| 44                  | 1.85           | 2.15       | 2.59       | 3.01        | 3.35        | 3.77        |
| 45                  | 1.80           | 2.10       | 2.53       | 2.95        | 3.27        | 3.68        |
| 46                  | 1.77           | 2.06       | 2.47       | 2.88        | 3.20        | 3.60        |
| 47                  | 1.73           | 2.01       | 2.42       | 2.82        | 3.13        | 3.53        |
| 48                  | 1.69           | 1.98       | 2.37       | 2.76        | 3.07        | 3.45        |
| 49                  | 1.66           | 1.93       | 2.32       | 2.71        | 3.01        | 3.38        |
| 50                  | 1.63           | 1.90       | 2.27       | 2.65        | 2.95        | 3.32        |
| 51                  | 1.59           | 1.86       | 2.23       | 2.60        | 2.89        | 3.25        |
| 52                  | 1.56           | 1.82       | 2.19       | 2.55        | 2.84        | 3.19        |
| 53                  | 1.53           | 1.79       | 2.14       | 2.50        | 2.78        | 3.13        |
| 54                  | 1.51           | 1.76       | 2.11       | 2.46        | 2.73        | 3.07        |
| 55                  | 1.48           | 1.72       | 2.07       | 2.41        | 2.68        | 3.01        |
| 56                  | 1.45           | 1.69       | 2.03       | 2.37        | 2.63        | 2.96        |
| 57                  | 1.42           | 1.66       | 1.99       | 2.33        | 2.58        | 2.91        |
| 58                  | 1.40           | 1.64       | 1.96       | 2.29        | 2.54        | 2.86        |
| 59                  | 1.38           | 1.61       | 1.93       | 2.25        | 2.50        | 2.81        |
| 60                  | 1.36           | 1.58       | 1.90       | 2.21        | 2.46        | 2.76        |
| Constants           | 81.16          | 94.69      | 113.63     | 132.56      | 147.29      | 165.70      |

# TWIST GEARING TABLE—(Continued)

42" TWISTERS

**GROOVED PULLEY 6 IN. DIAM. WHIRL 2½ INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 2.49

**FRONT ROLL 1½ INCHES DIAM. FRONT ROLL GEAR 112 TEETH**

| Change<br><br>Gears | TWIST PER INCH |             |             |             |             |             |
|---------------------|----------------|-------------|-------------|-------------|-------------|-------------|
|                     | Cyl. 40 T.     | Cyl. 36 T.  | Cyl. 30 T.  | Cyl. 30 T.  | Cyl. 27 T.  | Cyl. 24 T.  |
|                     | Jack 120 T.    | Jack 120 T. | Jack 120 T. | Jack 132 T. | Jack 132 T. | Jack 132 T. |
| 16                  | 11.10          | 12.33       | 14.80       | 16.27       | 18.08       | 20.34       |
| 17                  | 10.44          | 11.60       | 13.92       | 15.32       | 17.02       | 19.15       |
| 18                  | 9.86           | 10.96       | 13.15       | 14.47       | 16.07       | 18.08       |
| 19                  | 9.34           | 10.38       | 12.46       | 13.70       | 15.23       | 17.13       |
| 20                  | 8.88           | 9.86        | 11.84       | 13.02       | 14.47       | 16.27       |
| 21                  | 8.45           | 9.39        | 11.27       | 12.40       | 13.78       | 15.50       |
| 22                  | 8.07           | 8.97        | 10.76       | 11.84       | 13.15       | 14.80       |
| 23                  | 7.72           | 8.58        | 10.29       | 11.32       | 12.58       | 14.15       |
| 24                  | 7.40           | 8.22        | 9.86        | 10.85       | 12.06       | 13.56       |
| 25                  | 7.10           | 7.89        | 9.47        | 10.42       | 11.57       | 13.01       |
| 26                  | 6.83           | 7.59        | 9.10        | 10.02       | 11.13       | 12.52       |
| 27                  | 6.58           | 7.31        | 8.77        | 9.64        | 10.72       | 12.06       |
| 28                  | 6.34           | 7.05        | 8.45        | 9.30        | 10.33       | 11.62       |
| 29                  | 6.12           | 6.80        | 8.16        | 8.98        | 9.98        | 11.22       |
| 30                  | 5.92           | 6.57        | 7.89        | 8.68        | 9.64        | 10.85       |
| 31                  | 5.73           | 6.36        | 7.64        | 8.40        | 9.33        | 10.50       |
| 32                  | 5.55           | 6.16        | 7.40        | 8.14        | 9.04        | 10.17       |
| 33                  | 5.38           | 5.98        | 7.17        | 7.89        | 8.77        | 9.86        |
| 34                  | 5.22           | 5.80        | 6.96        | 7.66        | 8.51        | 9.58        |
| 35                  | 5.07           | 5.64        | 6.76        | 7.44        | 8.27        | 9.30        |
| 36                  | 4.93           | 5.48        | 6.58        | 7.24        | 8.04        | 9.04        |
| 37                  | 4.80           | 5.33        | 6.40        | 7.04        | 7.82        | 8.80        |
| 38                  | 4.67           | 5.19        | 6.23        | 6.85        | 7.62        | 8.57        |
| 39                  | 4.55           | 5.06        | 6.07        | 6.68        | 7.42        | 8.35        |
| 40                  | 4.44           | 4.93        | 5.92        | 6.51        | 7.24        | 8.14        |
| 41                  | 4.33           | 4.81        | 5.77        | 6.35        | 7.06        | 7.94        |
| 42                  | 4.23           | 4.70        | 5.64        | 6.20        | 6.89        | 7.75        |
| 43                  | 4.13           | 4.59        | 5.51        | 6.06        | 6.73        | 7.57        |
| 44                  | 4.04           | 4.48        | 5.38        | 5.92        | 6.58        | 7.40        |
| 45                  | 3.95           | 4.38        | 5.26        | 5.79        | 6.43        | 7.23        |
| 46                  | 3.86           | 4.29        | 5.15        | 5.66        | 6.29        | 7.08        |
| 47                  | 3.78           | 4.20        | 5.04        | 5.54        | 6.16        | 6.93        |
| 48                  | 3.70           | 4.11        | 4.93        | 5.42        | 6.03        | 6.78        |
| 49                  | 3.62           | 4.03        | 4.83        | 5.31        | 5.90        | 6.64        |
| 50                  | 3.55           | 3.95        | 4.73        | 5.21        | 5.79        | 6.51        |
| 51                  | 3.48           | 3.87        | 4.64        | 5.11        | 5.67        | 6.38        |
| 52                  | 3.42           | 3.79        | 4.55        | 5.01        | 5.56        | 6.26        |
| 53                  | 3.35           | 3.72        | 4.47        | 4.91        | 5.46        | 6.14        |
| 54                  | 3.29           | 3.65        | 4.38        | 4.82        | 5.36        | 6.03        |
| 55                  | 3.23           | 3.59        | 4.30        | 4.73        | 5.26        | 5.92        |
| 56                  | 3.17           | 3.52        | 4.23        | 4.65        | 5.17        | 5.81        |
| 57                  | 3.11           | 3.46        | 4.15        | 4.57        | 5.08        | 5.71        |
| 58                  | 3.06           | 3.40        | 4.08        | 4.49        | 4.99        | 5.61        |
| 59                  | 3.01           | 3.34        | 4.01        | 4.41        | 4.90        | 5.52        |
| 60                  | 2.96           | 3.29        | 3.95        | 4.34        | 4.82        | 5.43        |
| Constants           | 177.54         | 197.27      | 236.72      | 260.39      | 289.32      | 325.49      |

# TWIST GEARING TABLE

42" TWISTERS

**CROOVED PULLEY 6 IN. DIAM. WHIRL 2½ INCHES DIAM.**

RATIO OF CYLINDER TO WHIRL 1 TO 2.26

**FRONT ROLL 1½ INCHES DIAM. FRONT ROLL GEAR 112 TEETH**

| Change<br>Gears | TWIST PER INCH |            |            |             |             |             |
|-----------------|----------------|------------|------------|-------------|-------------|-------------|
|                 | Cyl. 70 T.     | Cyl. 60 T. | Cyl. 50 T. | Cyl. 50 T.  | Cyl. 45 T.  | Cyl. 40 T.  |
|                 | Jack 96 T.     | Jack 96 T. | Jack 96 T. | Jack 112 T. | Jack 112 T. | Jack 112 T. |
| 16              | 4.60           | 5.37       | 6.45       | 7.52        | 8.36        | 9.40        |
| 17              | 4.33           | 5.06       | 6.07       | 7.08        | 7.86        | 8.85        |
| 18              | 4.09           | 4.77       | 5.73       | 6.68        | 7.43        | 8.36        |
| 19              | 3.89           | 4.52       | 5.43       | 6.33        | 7.04        | 7.92        |
| 20              | 3.68           | 4.30       | 5.16       | 6.02        | 6.68        | 7.52        |
| 21              | 3.51           | 4.09       | 4.91       | 5.73        | 6.37        | 7.16        |
| 22              | 3.35           | 3.91       | 4.69       | 5.47        | 6.08        | 6.84        |
| 23              | 3.20           | 3.74       | 4.48       | 5.23        | 5.81        | 6.54        |
| 24              | 3.07           | 3.58       | 4.30       | 5.01        | 5.57        | 6.27        |
| 25              | 2.95           | 3.44       | 4.13       | 4.81        | 5.35        | 6.02        |
| 26              | 2.83           | 3.31       | 3.97       | 4.63        | 5.14        | 5.78        |
| 27              | 2.73           | 3.18       | 3.82       | 4.46        | 4.95        | 5.57        |
| 28              | 2.63           | 3.07       | 3.68       | 4.30        | 4.77        | 5.37        |
| 29              | 2.54           | 2.96       | 3.56       | 4.15        | 4.61        | 5.19        |
| 30              | 2.46           | 2.86       | 3.44       | 4.01        | 4.46        | 5.01        |
| 31              | 2.38           | 2.77       | 3.33       | 3.88        | 4.31        | 4.85        |
| 32              | 2.30           | 2.69       | 3.23       | 3.76        | 4.18        | 4.70        |
| 33              | 2.23           | 2.60       | 3.13       | 3.65        | 4.05        | 4.56        |
| 34              | 2.17           | 2.53       | 3.04       | 3.54        | 3.93        | 4.43        |
| 35              | 2.10           | 2.46       | 2.95       | 3.44        | 3.82        | 4.30        |
| 36              | 2.05           | 2.39       | 2.87       | 3.34        | 3.72        | 4.18        |
| 37              | 1.99           | 2.32       | 2.79       | 3.25        | 3.61        | 4.06        |
| 38              | 1.94           | 2.26       | 2.72       | 3.17        | 3.52        | 3.96        |
| 39              | 1.89           | 2.20       | 2.64       | 3.08        | 3.43        | 3.86        |
| 40              | 1.84           | 2.15       | 2.58       | 3.01        | 3.34        | 3.76        |
| 41              | 1.80           | 2.10       | 2.52       | 2.93        | 3.26        | 3.67        |
| 42              | 1.76           | 2.05       | 2.46       | 2.86        | 3.19        | 3.58        |
| 43              | 1.71           | 2.00       | 2.40       | 2.80        | 3.11        | 3.50        |
| 44              | 1.67           | 1.96       | 2.35       | 2.74        | 3.04        | 3.42        |
| 45              | 1.64           | 1.91       | 2.29       | 2.67        | 2.97        | 3.34        |
| 46              | 1.60           | 1.87       | 2.24       | 2.62        | 2.91        | 3.27        |
| 47              | 1.57           | 1.83       | 2.19       | 2.56        | 2.84        | 3.20        |
| 48              | 1.54           | 1.79       | 2.15       | 2.51        | 2.79        | 3.14        |
| 49              | 1.50           | 1.75       | 2.10       | 2.46        | 2.73        | 3.07        |
| 50              | 1.47           | 1.72       | 2.06       | 2.41        | 2.68        | 3.01        |
| 51              | 1.44           | 1.69       | 2.02       | 2.36        | 2.62        | 2.95        |
| 52              | 1.42           | 1.66       | 1.99       | 2.32        | 2.57        | 2.89        |
| 53              | 1.39           | 1.62       | 1.95       | 2.27        | 2.52        | 2.84        |
| 54              | 1.37           | 1.59       | 1.91       | 2.23        | 2.48        | 2.79        |
| 55              | 1.34           | 1.56       | 1.88       | 2.19        | 2.43        | 2.73        |
| 56              | 1.32           | 1.54       | 1.84       | 2.15        | 2.39        | 2.69        |
| 57              | 1.29           | 1.51       | 1.81       | 2.11        | 2.35        | 2.64        |
| 58              | 1.27           | 1.48       | 1.78       | 2.08        | 2.31        | 2.60        |
| 59              | 1.25           | 1.46       | 1.75       | 2.04        | 2.27        | 2.55        |
| 60              | 1.23           | 1.43       | 1.72       | 2.01        | 2.23        | 2.52        |
| Constants       | 73.66          | 85.94      | 103.13     | 120.31      | 133.69      | 150.40      |

# TWIST GEARING TABLE—(Continued)

42" TWISTERS

CRCOVED PULLEY 6 IN. DIAM. WHIRL 2½ INCHES DIAM.

RATIO OF CYLINDER TO WHIRL 1 TO 2.26

FRONT ROLL 1½ INCHES DIAM. FRONT ROLL GEAR 112 TEETH

| Change<br>Gears | TWIST PER INCH            |                           |                           |                           |                           |                           |
|-----------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
|                 | Cyl. 40 T.<br>Jack 120 T. | Cyl. 36 T.<br>Jack 120 T. | Cyl. 30 T.<br>Jack 120 T. | Cyl. 30 T.<br>Jack 132 T. | Cyl. 27 T.<br>Jack 132 T. | Cyl. 24 T.<br>Jack 132 T. |
| 16              | 10.07                     | 11.19                     | 13.43                     | 14.77                     | 16.41                     | 18.46                     |
| 17              | 9.48                      | 10.53                     | 12.64                     | 13.90                     | 15.45                     | 17.38                     |
| 18              | 8.95                      | 9.95                      | 11.94                     | 13.13                     | 14.59                     | 16.41                     |
| 19              | 8.48                      | 9.42                      | 11.31                     | 12.44                     | 13.82                     | 15.55                     |
| 20              | 8.06                      | 8.95                      | 10.74                     | 11.82                     | 13.13                     | 14.77                     |
| 21              | 7.67                      | 8.53                      | 10.23                     | 11.25                     | 12.50                     | 14.07                     |
| 22              | 7.32                      | 8.14                      | 9.77                      | 10.74                     | 11.94                     | 13.43                     |
| 23              | 7.01                      | 7.78                      | 9.34                      | 10.28                     | 11.42                     | 12.84                     |
| 24              | 6.71                      | 7.46                      | 8.95                      | 9.85                      | 10.94                     | 12.31                     |
| 25              | 6.45                      | 7.16                      | 8.59                      | 9.45                      | 10.50                     | 11.82                     |
| 26              | 6.20                      | 6.89                      | 8.26                      | 9.09                      | 10.10                     | 11.36                     |
| 27              | 5.97                      | 6.63                      | 7.96                      | 8.75                      | 9.73                      | 10.94                     |
| 28              | 5.76                      | 6.39                      | 7.67                      | 8.44                      | 9.38                      | 10.55                     |
| 29              | 5.56                      | 6.17                      | 7.41                      | 8.15                      | 9.06                      | 10.19                     |
| 30              | 5.37                      | 5.97                      | 7.16                      | 7.88                      | 8.75                      | 9.85                      |
| 31              | 5.20                      | 5.78                      | 6.93                      | 7.62                      | 8.47                      | 9.53                      |
| 32              | 5.04                      | 5.60                      | 6.72                      | 7.39                      | 8.21                      | 9.23                      |
| 33              | 4.88                      | 5.43                      | 6.51                      | 7.16                      | 7.96                      | 8.95                      |
| 34              | 4.74                      | 5.27                      | 6.32                      | 6.95                      | 7.73                      | 8.69                      |
| 35              | 4.60                      | 5.12                      | 6.14                      | 6.75                      | 7.50                      | 8.44                      |
| 36              | 4.48                      | 4.98                      | 5.97                      | 6.57                      | 7.30                      | 8.21                      |
| 37              | 4.36                      | 4.84                      | 5.81                      | 6.39                      | 7.10                      | 7.98                      |
| 38              | 4.24                      | 4.71                      | 5.66                      | 6.22                      | 6.91                      | 7.78                      |
| 39              | 4.13                      | 4.59                      | 5.51                      | 6.06                      | 6.73                      | 7.57                      |
| 40              | 4.03                      | 4.48                      | 5.37                      | 5.91                      | 6.57                      | 7.39                      |
| 41              | 3.93                      | 4.37                      | 5.24                      | 5.76                      | 6.41                      | 7.21                      |
| 42              | 3.84                      | 4.27                      | 5.12                      | 5.63                      | 6.25                      | 7.04                      |
| 43              | 3.75                      | 4.16                      | 5.00                      | 5.50                      | 6.11                      | 6.87                      |
| 44              | 3.66                      | 4.07                      | 4.89                      | 5.37                      | 5.97                      | 6.72                      |
| 45              | 3.58                      | 3.98                      | 4.77                      | 5.25                      | 5.84                      | 6.57                      |
| 46              | 3.51                      | 3.89                      | 4.67                      | 5.14                      | 5.71                      | 6.42                      |
| 47              | 3.43                      | 3.81                      | 4.57                      | 5.03                      | 5.59                      | 6.29                      |
| 48              | 3.36                      | 3.73                      | 4.48                      | 4.92                      | 5.47                      | 6.16                      |
| 49              | 3.29                      | 3.65                      | 4.38                      | 4.82                      | 5.36                      | 6.03                      |
| 50              | 3.23                      | 3.58                      | 4.30                      | 4.73                      | 5.25                      | 5.91                      |
| 51              | 3.16                      | 3.51                      | 4.21                      | 4.63                      | 5.15                      | 5.79                      |
| 52              | 3.10                      | 3.45                      | 4.13                      | 4.55                      | 5.05                      | 5.68                      |
| 53              | 3.04                      | 3.38                      | 4.05                      | 4.46                      | 4.95                      | 5.57                      |
| 54              | 2.99                      | 3.32                      | 3.98                      | 4.38                      | 4.86                      | 5.47                      |
| 55              | 2.93                      | 3.26                      | 3.91                      | 4.30                      | 4.77                      | 5.37                      |
| 56              | 2.88                      | 3.20                      | 3.84                      | 4.22                      | 4.69                      | 5.28                      |
| 57              | 2.83                      | 3.14                      | 3.77                      | 4.15                      | 4.61                      | 5.18                      |
| 58              | 2.78                      | 3.09                      | 3.71                      | 4.08                      | 4.53                      | 5.10                      |
| 59              | 2.73                      | 3.03                      | 3.64                      | 4.01                      | 4.45                      | 5.01                      |
| 60              | 2.69                      | 2.98                      | 3.58                      | 3.94                      | 4.38                      | 4.93                      |
| Constants       | 161.14                    | 179.05                    | 214.85                    | 236.34                    | 262.60                    | 295.42                    |

# TWO PLY TWIST TABLE

| No. of<br>Yarn<br>to be<br>Twisted | No. of<br>Twisted<br>Yarn | Sq. Root<br>of No. of<br>Twisted<br>Yarn | TWIST PER INCH            |       |                |       |                |       |                |
|------------------------------------|---------------------------|--|---------------------------|-------|----------------|-------|----------------|-------|----------------|
|                                    |                           |  | Square Root Multiplied by |       |                |       |                |       |                |
|                                    |                           |  | $1\frac{1}{2}$            | 2     | $2\frac{1}{2}$ | 3     | $3\frac{1}{2}$ | 4     | $4\frac{1}{2}$ |
| 1                                  | .5                        | .707                                     | 1.06                      | 1.41  | 1.77           | 2.12  | 2.47           | 2.83  | 3.18           |
| 2                                  | 1.0                       | 1.000                                    | 1.50                      | 2.00  | 2.50           | 3.00  | 3.50           | 4.00  | 4.50           |
| 3                                  | 1.5                       | 1.225                                    | 1.84                      | 2.45  | 3.06           | 3.68  | 4.29           | 4.90  | 5.51           |
| 4                                  | 2.0                       | 1.414                                    | 2.12                      | 2.83  | 3.54           | 4.24  | 4.95           | 5.66  | 6.36           |
| 5                                  | 2.5                       | 1.581                                    | 2.37                      | 3.16  | 3.95           | 4.74  | 5.53           | 6.32  | 7.11           |
| 6                                  | 3.0                       | 1.732                                    | 2.60                      | 3.46  | 4.33           | 5.20  | 6.06           | 6.93  | 7.79           |
| 7                                  | 3.5                       | 1.871                                    | 2.81                      | 3.74  | 4.68           | 5.61  | 6.55           | 7.48  | 8.42           |
| 8                                  | 4.0                       | 2.000                                    | 3.00                      | 4.00  | 5.00           | 6.00  | 7.00           | 8.00  | 9.00           |
| 9                                  | 4.5                       | 2.121                                    | 3.18                      | 4.24  | 5.30           | 6.36  | 7.42           | 8.48  | 9.54           |
| 10                                 | 5.0                       | 2.236                                    | 3.35                      | 4.47  | 5.59           | 6.71  | 7.83           | 8.94  | 10.06          |
| 11                                 | 5.5                       | 2.345                                    | 3.52                      | 4.69  | 5.86           | 7.04  | 8.21           | 9.38  | 10.55          |
| 12                                 | 6.0                       | 2.450                                    | 3.68                      | 4.90  | 6.13           | 7.35  | 8.58           | 9.80  | 11.03          |
| 13                                 | 6.5                       | 2.550                                    | 3.83                      | 5.10  | 6.38           | 7.65  | 8.93           | 10.20 | 11.48          |
| 14                                 | 7.0                       | 2.646                                    | 3.97                      | 5.29  | 6.62           | 7.94  | 9.26           | 10.58 | 11.91          |
| 15                                 | 7.5                       | 2.739                                    | 4.11                      | 5.48  | 6.85           | 8.22  | 9.59           | 10.95 | 12.33          |
| 16                                 | 8.0                       | 2.828                                    | 4.24                      | 5.66  | 7.07           | 8.48  | 9.90           | 11.31 | 12.73          |
| 17                                 | 8.5                       | 2.916                                    | 4.37                      | 5.83  | 7.29           | 8.75  | 10.21          | 11.66 | 13.12          |
| 18                                 | 9.0                       | 3.000                                    | 4.50                      | 6.00  | 7.50           | 9.00  | 10.50          | 12.00 | 13.50          |
| 19                                 | 9.5                       | 3.082                                    | 4.62                      | 6.16  | 7.71           | 9.25  | 10.79          | 12.33 | 13.87          |
| 20                                 | 10.0                      | 3.162                                    | 4.74                      | 6.32  | 7.91           | 9.49  | 11.07          | 12.65 | 14.23          |
| 21                                 | 10.5                      | 3.240                                    | 4.86                      | 6.48  | 8.10           | 9.72  | 11.34          | 12.96 | 14.58          |
| 22                                 | 11.0                      | 3.317                                    | 4.98                      | 6.63  | 8.29           | 9.95  | 11.61          | 13.27 | 14.93          |
| 23                                 | 11.5                      | 3.391                                    | 5.09                      | 6.78  | 8.48           | 10.17 | 11.87          | 13.56 | 15.26          |
| 24                                 | 12.0                      | 3.464                                    | 5.20                      | 6.93  | 8.66           | 10.39 | 12.12          | 13.86 | 15.59          |
| 25                                 | 12.5                      | 3.536                                    | 5.30                      | 7.07  | 8.84           | 10.61 | 12.38          | 14.14 | 15.91          |
| 26                                 | 13.0                      | 3.606                                    | 5.41                      | 7.21  | 9.02           | 10.82 | 12.62          | 14.42 | 16.23          |
| 27                                 | 13.5                      | 3.674                                    | 5.51                      | 7.35  | 9.19           | 11.02 | 12.86          | 14.70 | 16.53          |
| 28                                 | 14.0                      | 3.742                                    | 5.61                      | 7.48  | 9.36           | 11.23 | 13.10          | 14.97 | 16.84          |
| 29                                 | 14.5                      | 3.808                                    | 5.71                      | 7.62  | 9.52           | 11.42 | 13.33          | 15.23 | 17.14          |
| 30                                 | 15.0                      | 3.873                                    | 5.81                      | 7.75  | 9.68           | 11.62 | 13.56          | 15.49 | 17.43          |
| 31                                 | 15.5                      | 3.937                                    | 5.91                      | 7.87  | 9.84           | 11.81 | 13.78          | 15.75 | 17.72          |
| 32                                 | 16.0                      | 4.000                                    | 6.00                      | 8.00  | 10.00          | 12.00 | 14.00          | 16.00 | 18.00          |
| 33                                 | 16.5                      | 4.062                                    | 6.09                      | 8.12  | 10.16          | 12.19 | 14.22          | 16.25 | 18.28          |
| 34                                 | 17.0                      | 4.123                                    | 6.18                      | 8.25  | 10.31          | 12.37 | 14.43          | 16.49 | 18.55          |
| 35                                 | 17.5                      | 4.183                                    | 6.27                      | 8.37  | 10.46          | 12.55 | 14.64          | 16.73 | 18.82          |
| 36                                 | 18.0                      | 4.243                                    | 6.36                      | 8.49  | 10.61          | 12.73 | 14.85          | 16.97 | 19.09          |
| 37                                 | 18.5                      | 4.301                                    | 6.45                      | 8.60  | 10.75          | 12.90 | 15.05          | 17.20 | 19.35          |
| 38                                 | 19.0                      | 4.359                                    | 6.54                      | 8.72  | 10.90          | 13.08 | 15.26          | 17.44 | 19.62          |
| 39                                 | 19.5                      | 4.416                                    | 6.62                      | 8.83  | 11.04          | 13.25 | 15.46          | 17.66 | 19.87          |
| 40                                 | 20.0                      | 4.472                                    | 6.71                      | 8.94  | 11.18          | 13.42 | 15.65          | 17.89 | 20.12          |
| 41                                 | 20.5                      | 4.528                                    | 6.79                      | 9.06  | 11.32          | 13.58 | 15.85          | 18.11 | 20.37          |
| 42                                 | 21.0                      | 4.583                                    | 6.87                      | 9.17  | 11.46          | 13.75 | 16.04          | 18.33 | 20.62          |
| 43                                 | 21.5                      | 4.637                                    | 6.96                      | 9.27  | 11.59          | 13.91 | 16.23          | 18.55 | 20.87          |
| 44                                 | 22.0                      | 4.690                                    | 7.04                      | 9.38  | 11.73          | 14.07 | 16.42          | 18.76 | 21.11          |
| 45                                 | 22.5                      | 4.743                                    | 7.11                      | 9.49  | 11.86          | 14.23 | 16.60          | 18.97 | 21.34          |
| 46                                 | 23.0                      | 4.796                                    | 7.19                      | 9.59  | 11.99          | 14.39 | 16.79          | 19.18 | 21.58          |
| 47                                 | 23.5                      | 4.848                                    | 7.27                      | 9.70  | 12.12          | 14.54 | 16.97          | 19.39 | 21.82          |
| 48                                 | 24.0                      | 4.899                                    | 7.35                      | 9.80  | 12.25          | 14.70 | 17.15          | 19.60 | 22.05          |
| 49                                 | 24.5                      | 4.950                                    | 7.43                      | 9.90  | 12.38          | 14.85 | 17.33          | 19.80 | 22.28          |
| 50                                 | 25.0                      | 5.000                                    | 7.50                      | 10.00 | 12.50          | 15.00 | 17.50          | 20.00 | 22.50          |
| 51                                 | 25.5                      | 5.050                                    | 7.58                      | 10.10 | 12.63          | 15.15 | 17.68          | 20.20 | 22.73          |
| 52                                 | 26.0                      | 5.099                                    | 7.65                      | 10.20 | 12.75          | 15.30 | 17.85          | 20.40 | 22.95          |
| 53                                 | 26.5                      | 5.148                                    | 7.72                      | 10.30 | 12.87          | 15.44 | 18.02          | 20.59 | 23.17          |
| 54                                 | 27.0                      | 5.196                                    | 7.79                      | 10.39 | 12.99          | 15.59 | 18.19          | 20.78 | 23.38          |
| 55                                 | 27.5                      | 5.244                                    | 7.87                      | 10.49 | 13.11          | 15.73 | 18.35          | 20.98 | 23.60          |
| 56                                 | 28.0                      | 5.292                                    | 7.94                      | 10.58 | 13.23          | 15.88 | 18.52          | 21.17 | 23.81          |
| 57                                 | 28.5                      | 5.339                                    | 8.01                      | 10.68 | 13.35          | 16.02 | 18.69          | 21.36 | 24.03          |
| 58                                 | 29.0                      | 5.385                                    | 8.08                      | 10.77 | 13.46          | 16.16 | 18.85          | 21.54 | 24.23          |
| 59                                 | 29.5                      | 5.431                                    | 8.15                      | 10.86 | 13.58          | 16.29 | 19.01          | 21.73 | 24.44          |
| 60                                 | 30.0                      | 5.477                                    | 8.22                      | 10.95 | 13.69          | 16.43 | 19.17          | 21.91 | 24.65          |



# TWO PLY TWIST TABLE—(Continued)

| No. of<br>Yarn<br>to be<br>Twisted | No. of<br>Twisted<br>Yarn | Sq. Root<br>of No. of<br>Twisted<br>Yarn | TWIST PER INCH            |       |       |       |       |       |       |
|------------------------------------|---------------------------|--|---------------------------|-------|-------|-------|-------|-------|-------|
|                                    |                           |  | Square Root Multiplied by |       |       |       |       |       |       |
|                                    |                           |  | 5                         | 5½    | 6     | 6½    | 7     | 7½    | 8     |
| 1                                  | .5                        | .707                                     | 3.54                      | 3.89  | 4.24  | 4.60  | 4.95  | 5.30  | 5.66  |
| 2                                  | 1.0                       | 1.000                                    | 5.00                      | 5.50  | 6.00  | 6.50  | 7.00  | 7.50  | 8.00  |
| 3                                  | 1.5                       | 1.225                                    | 6.13                      | 6.74  | 7.35  | 7.96  | 8.58  | 9.19  | 9.80  |
| 4                                  | 2.0                       | 1.414                                    | 7.07                      | 7.78  | 8.49  | 9.19  | 9.90  | 10.61 | 11.31 |
| 5                                  | 2.5                       | 1.581                                    | 7.91                      | 8.70  | 9.49  | 10.28 | 11.07 | 11.86 | 12.65 |
| 6                                  | 3.0                       | 1.732                                    | 8.66                      | 9.53  | 10.39 | 11.26 | 12.12 | 12.99 | 13.86 |
| 7                                  | 3.5                       | 1.871                                    | 9.36                      | 10.29 | 11.22 | 12.16 | 13.10 | 14.03 | 14.97 |
| 8                                  | 4.0                       | 2.000                                    | 10.00                     | 11.00 | 12.00 | 13.00 | 14.00 | 15.00 | 16.00 |
| 9                                  | 4.5                       | 2.121                                    | 10.61                     | 11.67 | 12.73 | 13.79 | 14.85 | 15.91 | 16.97 |
| 10                                 | 5.0                       | 2.236                                    | 11.18                     | 12.30 | 13.42 | 14.53 | 15.65 | 16.77 | 17.89 |
| 11                                 | 5.5                       | 2.345                                    | 11.73                     | 12.90 | 14.07 | 15.24 | 16.42 | 17.59 | 18.76 |
| 12                                 | 6.0                       | 2.450                                    | 12.25                     | 13.48 | 14.70 | 15.93 | 17.15 | 18.38 | 19.60 |
| 13                                 | 6.5                       | 2.550                                    | 12.75                     | 14.03 | 15.30 | 16.58 | 17.85 | 19.13 | 20.40 |
| 14                                 | 7.0                       | 2.646                                    | 13.23                     | 14.55 | 15.87 | 17.20 | 18.52 | 19.85 | 21.17 |
| 15                                 | 7.5                       | 2.739                                    | 13.69                     | 15.06 | 16.43 | 17.80 | 19.17 | 20.54 | 21.91 |
| 16                                 | 8.0                       | 2.828                                    | 14.14                     | 15.55 | 16.97 | 18.38 | 19.80 | 21.21 | 22.62 |
| 17                                 | 8.5                       | 2.916                                    | 14.58                     | 16.04 | 17.49 | 18.95 | 20.41 | 21.87 | 23.33 |
| 18                                 | 9.0                       | 3.000                                    | 15.00                     | 16.50 | 18.00 | 19.50 | 21.00 | 22.50 | 24.00 |
| 19                                 | 9.5                       | 3.082                                    | 15.41                     | 16.95 | 18.49 | 20.03 | 21.57 | 23.12 | 24.66 |
| 20                                 | 10.0                      | 3.162                                    | 15.81                     | 17.39 | 18.97 | 20.55 | 22.13 | 23.72 | 25.30 |
| 21                                 | 10.5                      | 3.240                                    | 16.20                     | 17.82 | 19.44 | 21.06 | 22.68 | 24.30 | 25.92 |
| 22                                 | 11.0                      | 3.317                                    | 16.58                     | 18.24 | 19.90 | 21.56 | 23.22 | 24.88 | 26.54 |
| 23                                 | 11.5                      | 3.391                                    | 16.96                     | 18.65 | 20.35 | 22.04 | 23.74 | 25.43 | 27.13 |
| 24                                 | 12.0                      | 3.464                                    | 17.32                     | 19.05 | 20.78 | 22.52 | 24.25 | 25.98 | 27.71 |
| 25                                 | 12.5                      | 3.536                                    | 17.68                     | 19.45 | 21.21 | 22.98 | 24.75 | 26.52 | 28.29 |
| 26                                 | 13.0                      | 3.606                                    | 18.03                     | 19.83 | 21.63 | 23.44 | 25.24 | 27.05 | 28.85 |
| 27                                 | 13.5                      | 3.674                                    | 18.37                     | 20.21 | 22.05 | 23.88 | 25.72 | 27.56 | 29.39 |
| 28                                 | 14.0                      | 3.742                                    | 18.71                     | 20.58 | 22.45 | 24.32 | 26.19 | 28.07 | 29.94 |
| 29                                 | 14.5                      | 3.808                                    | 19.04                     | 20.94 | 22.85 | 24.75 | 26.66 | 28.56 | 30.46 |
| 30                                 | 15.0                      | 3.873                                    | 19.37                     | 21.30 | 23.24 | 25.17 | 27.11 | 29.05 | 30.98 |
| 31                                 | 15.5                      | 3.937                                    | 19.69                     | 21.65 | 23.62 | 25.59 | 27.56 | 29.53 | 31.50 |
| 32                                 | 16.0                      | 4.000                                    | 20.00                     | 22.00 | 24.00 | 26.00 | 28.00 | 30.00 | 32.00 |
| 33                                 | 16.5                      | 4.062                                    | 20.31                     | 22.34 | 24.37 | 26.40 | 28.43 | 30.47 | 32.50 |
| 34                                 | 17.0                      | 4.123                                    | 20.62                     | 22.68 | 24.74 | 26.80 | 28.86 | 30.92 | 32.98 |
| 35                                 | 17.5                      | 4.183                                    | 20.92                     | 23.01 | 25.10 | 27.19 | 29.28 | 31.37 | 33.46 |
| 36                                 | 18.0                      | 4.243                                    | 21.21                     | 23.34 | 25.46 | 27.58 | 29.70 | 31.82 | 33.94 |
| 37                                 | 18.5                      | 4.301                                    | 21.51                     | 23.66 | 25.81 | 27.96 | 30.11 | 32.26 | 34.41 |
| 38                                 | 19.0                      | 4.359                                    | 21.80                     | 23.97 | 26.15 | 28.33 | 30.51 | 32.69 | 34.87 |
| 39                                 | 19.5                      | 4.416                                    | 22.08                     | 24.29 | 26.50 | 28.70 | 30.91 | 33.12 | 35.33 |
| 40                                 | 20.0                      | 4.472                                    | 22.36                     | 24.60 | 26.83 | 29.07 | 31.30 | 33.54 | 35.78 |
| 41                                 | 20.5                      | 4.528                                    | 22.64                     | 24.90 | 27.17 | 29.43 | 31.70 | 33.96 | 36.22 |
| 42                                 | 21.0                      | 4.583                                    | 22.91                     | 25.21 | 27.50 | 29.79 | 32.08 | 34.37 | 36.66 |
| 43                                 | 21.5                      | 4.637                                    | 23.19                     | 25.50 | 27.82 | 30.14 | 32.46 | 34.78 | 37.10 |
| 44                                 | 22.0                      | 4.690                                    | 23.45                     | 25.80 | 28.14 | 30.49 | 32.83 | 35.18 | 37.52 |
| 45                                 | 22.5                      | 4.743                                    | 23.72                     | 26.09 | 28.46 | 30.83 | 33.20 | 35.57 | 37.94 |
| 46                                 | 23.0                      | 4.796                                    | 23.98                     | 26.38 | 28.77 | 31.17 | 33.57 | 35.97 | 38.37 |
| 47                                 | 23.5                      | 4.848                                    | 24.24                     | 26.66 | 29.09 | 31.51 | 33.94 | 36.36 | 38.78 |
| 48                                 | 24.0                      | 4.899                                    | 24.49                     | 26.94 | 29.39 | 31.84 | 34.29 | 36.74 | 39.19 |
| 49                                 | 24.5                      | 4.950                                    | 24.75                     | 27.23 | 29.70 | 32.18 | 34.65 | 37.13 | 39.60 |
| 50                                 | 25.0                      | 5.000                                    | 25.00                     | 27.50 | 30.00 | 32.50 | 35.00 | 37.50 | 40.00 |
| 51                                 | 25.5                      | 5.050                                    | 25.25                     | 27.78 | 30.30 | 32.83 | 35.35 | 37.88 | 40.40 |
| 52                                 | 26.0                      | 5.099                                    | 25.50                     | 28.04 | 30.59 | 33.14 | 35.69 | 38.24 | 40.79 |
| 53                                 | 26.5                      | 5.148                                    | 25.74                     | 28.31 | 30.89 | 33.46 | 36.04 | 38.61 | 41.18 |
| 54                                 | 27.0                      | 5.196                                    | 25.98                     | 28.58 | 31.18 | 33.77 | 36.37 | 38.97 | 41.57 |
| 55                                 | 27.5                      | 5.244                                    | 26.22                     | 28.84 | 31.46 | 34.09 | 36.71 | 39.33 | 41.95 |
| 56                                 | 28.0                      | 5.292                                    | 26.46                     | 29.11 | 31.75 | 34.40 | 37.04 | 39.69 | 42.34 |
| 57                                 | 28.5                      | 5.339                                    | 26.69                     | 29.36 | 32.03 | 34.70 | 37.37 | 40.04 | 42.71 |
| 58                                 | 29.0                      | 5.385                                    | 26.93                     | 29.62 | 32.31 | 35.00 | 37.70 | 40.39 | 43.08 |
| 59                                 | 29.5                      | 5.431                                    | 27.16                     | 29.87 | 32.59 | 35.30 | 38.02 | 40.73 | 43.45 |
| 60                                 | 30.0                      | 5.477                                    | 27.39                     | 30.12 | 32.86 | 35.60 | 38.34 | 41.08 | 43.82 |

**TWO PLY TWIST TABLE**—(Continued)

| No. of<br>Yarn<br>to be<br>Twisted | No. of<br>Twisted<br>Yarn | Sq. Root<br>of No. of<br>Twisted<br>Yarn | TWIST PER INCH            |       |       |       |       |       |       |
|------------------------------------|---------------------------|--|---------------------------|-------|-------|-------|-------|-------|-------|
|                                    |                           |  | Square Root Multiplied by |       |       |       |       |       |       |
|                                    |                           |  | 4                         | 4½    | 5     | 5½    | 6     | 6½    | 7     |
| 61                                 | 30.5                      | 5.523                                    | 22.09                     | 24.85 | 27.61 | 30.38 | 33.14 | 35.90 | 38.66 |
| 62                                 | 31.0                      | 5.568                                    | 22.27                     | 25.06 | 27.84 | 30.62 | 33.41 | 36.19 | 38.98 |
| 63                                 | 31.5                      | 5.613                                    | 22.45                     | 25.26 | 28.06 | 30.87 | 33.67 | 36.48 | 39.29 |
| 64                                 | 32.0                      | 5.657                                    | 22.63                     | 25.46 | 28.28 | 31.11 | 33.94 | 36.77 | 39.60 |
| 65                                 | 32.5                      | 5.701                                    | 22.80                     | 25.65 | 28.50 | 31.36 | 34.21 | 37.06 | 39.91 |
| 66                                 | 33.0                      | 5.745                                    | 22.98                     | 25.85 | 28.72 | 31.60 | 34.47 | 37.34 | 40.22 |
| 67                                 | 33.5                      | 5.788                                    | 23.15                     | 26.05 | 28.94 | 31.83 | 34.73 | 37.62 | 40.52 |
| 68                                 | 34.0                      | 5.831                                    | 23.32                     | 26.24 | 29.15 | 32.07 | 34.99 | 37.90 | 40.82 |
| 69                                 | 34.5                      | 5.874                                    | 23.50                     | 26.43 | 29.37 | 32.31 | 35.24 | 38.18 | 41.12 |
| 70                                 | 35.0                      | 5.916                                    | 23.66                     | 26.62 | 29.58 | 32.54 | 35.50 | 38.45 | 41.41 |
| 71                                 | 35.5                      | 5.958                                    | 23.83                     | 26.81 | 29.79 | 32.77 | 35.75 | 38.73 | 41.71 |
| 72                                 | 36.0                      | 6.000                                    | 24.00                     | 27.00 | 30.00 | 33.00 | 36.00 | 39.00 | 42.00 |
| 73                                 | 36.5                      | 6.042                                    | 24.17                     | 27.19 | 30.21 | 33.23 | 36.25 | 39.27 | 42.29 |
| 74                                 | 37.0                      | 6.083                                    | 24.33                     | 27.37 | 30.41 | 33.46 | 36.50 | 39.54 | 42.58 |
| 75                                 | 37.5                      | 6.124                                    | 24.50                     | 27.56 | 30.62 | 33.68 | 36.74 | 39.81 | 42.87 |
| 76                                 | 38.0                      | 6.164                                    | 24.66                     | 27.74 | 30.82 | 33.90 | 36.99 | 40.07 | 43.15 |
| 77                                 | 38.5                      | 6.205                                    | 24.82                     | 27.92 | 31.02 | 34.13 | 37.23 | 40.33 | 43.44 |
| 78                                 | 39.0                      | 6.245                                    | 24.98                     | 28.10 | 31.22 | 34.35 | 37.47 | 40.59 | 43.72 |
| 79                                 | 39.5                      | 6.285                                    | 25.14                     | 28.28 | 31.42 | 34.57 | 37.71 | 40.85 | 44.00 |
| 80                                 | 40.0                      | 6.325                                    | 25.30                     | 28.46 | 31.62 | 34.79 | 37.95 | 41.11 | 44.28 |
| 81                                 | 40.5                      | 6.364                                    | 25.46                     | 28.64 | 31.82 | 35.00 | 38.18 | 41.37 | 44.55 |
| 82                                 | 41.0                      | 6.403                                    | 25.61                     | 28.81 | 32.02 | 35.22 | 38.42 | 41.62 | 44.82 |
| 83                                 | 41.5                      | 6.442                                    | 25.77                     | 28.99 | 32.21 | 35.43 | 38.65 | 41.87 | 45.09 |
| 84                                 | 42.0                      | 6.481                                    | 25.92                     | 29.16 | 32.41 | 35.65 | 38.88 | 42.13 | 45.37 |
| 85                                 | 42.5                      | 6.519                                    | 26.08                     | 29.34 | 32.60 | 35.85 | 39.11 | 42.37 | 45.63 |
| 86                                 | 43.0                      | 6.557                                    | 26.23                     | 29.51 | 32.79 | 36.06 | 39.34 | 42.62 | 45.90 |
| 87                                 | 43.5                      | 6.596                                    | 26.38                     | 29.68 | 32.98 | 36.28 | 39.57 | 42.87 | 46.17 |
| 88                                 | 44.0                      | 6.633                                    | 26.53                     | 29.85 | 33.17 | 36.48 | 39.80 | 43.11 | 46.43 |
| 89                                 | 44.5                      | 6.671                                    | 26.68                     | 30.02 | 33.35 | 36.69 | 40.02 | 43.36 | 46.70 |
| 90                                 | 45.0                      | 6.708                                    | 26.83                     | 30.19 | 33.54 | 36.89 | 40.25 | 43.60 | 46.96 |
| 91                                 | 45.5                      | 6.745                                    | 26.98                     | 30.35 | 33.73 | 37.10 | 40.47 | 43.84 | 47.22 |
| 92                                 | 46.0                      | 6.782                                    | 27.13                     | 30.52 | 33.91 | 37.30 | 40.69 | 44.08 | 47.47 |
| 93                                 | 46.5                      | 6.819                                    | 27.28                     | 30.69 | 34.10 | 37.50 | 40.91 | 44.32 | 47.73 |
| 94                                 | 47.0                      | 6.856                                    | 27.42                     | 30.85 | 34.28 | 37.71 | 41.13 | 44.56 | 47.99 |
| 95                                 | 47.5                      | 6.892                                    | 27.57                     | 31.01 | 34.46 | 37.91 | 41.35 | 44.80 | 48.24 |
| 96                                 | 48.0                      | 6.928                                    | 27.71                     | 31.18 | 34.64 | 38.10 | 41.57 | 45.03 | 48.50 |
| 97                                 | 48.5                      | 6.964                                    | 27.86                     | 31.34 | 34.82 | 38.30 | 41.79 | 45.27 | 48.75 |
| 98                                 | 49.0                      | 7.000                                    | 28.00                     | 31.50 | 35.00 | 38.50 | 42.00 | 45.50 | 49.00 |
| 99                                 | 49.5                      | 7.036                                    | 28.14                     | 31.66 | 35.18 | 38.70 | 42.21 | 45.73 | 49.25 |
| 100                                | 50.0                      | 7.071                                    | 28.28                     | 31.82 | 35.36 | 38.89 | 42.43 | 45.96 | 49.50 |
| 101                                | 50.5                      | 7.106                                    | 28.42                     | 31.98 | 35.53 | 39.08 | 42.64 | 46.19 | 49.74 |
| 102                                | 51.0                      | 7.141                                    | 28.56                     | 32.13 | 35.70 | 39.28 | 42.85 | 46.42 | 49.99 |
| 103                                | 51.5                      | 7.176                                    | 28.70                     | 32.29 | 35.88 | 39.47 | 43.06 | 46.64 | 50.23 |
| 104                                | 52.0                      | 7.211                                    | 28.84                     | 32.45 | 36.06 | 39.66 | 43.27 | 46.87 | 50.48 |
| 105                                | 52.5                      | 7.246                                    | 28.98                     | 32.61 | 36.23 | 39.85 | 43.47 | 47.10 | 50.72 |
| 106                                | 53.0                      | 7.280                                    | 29.12                     | 32.76 | 36.40 | 40.04 | 43.68 | 47.32 | 50.96 |
| 107                                | 53.5                      | 7.314                                    | 29.26                     | 32.91 | 36.57 | 40.23 | 43.89 | 47.54 | 51.20 |
| 108                                | 54.0                      | 7.349                                    | 29.40                     | 33.07 | 36.74 | 40.42 | 44.09 | 47.77 | 51.44 |
| 109                                | 54.5                      | 7.382                                    | 29.53                     | 33.22 | 36.91 | 40.60 | 44.29 | 47.98 | 51.67 |
| 110                                | 55.0                      | 7.416                                    | 29.66                     | 33.37 | 37.08 | 40.79 | 44.50 | 48.20 | 51.91 |
| 111                                | 55.5                      | 7.450                                    | 29.80                     | 33.53 | 37.25 | 40.98 | 44.70 | 48.43 | 52.15 |
| 112                                | 56.0                      | 7.483                                    | 29.93                     | 33.67 | 37.42 | 41.16 | 44.90 | 48.64 | 52.38 |
| 113                                | 56.5                      | 7.517                                    | 30.07                     | 33.83 | 37.58 | 41.34 | 45.10 | 48.86 | 52.62 |
| 114                                | 57.0                      | 7.550                                    | 30.20                     | 33.98 | 37.75 | 41.53 | 45.30 | 49.08 | 52.85 |
| 115                                | 57.5                      | 7.583                                    | 30.33                     | 34.12 | 37.91 | 41.71 | 45.50 | 49.29 | 53.08 |
| 116                                | 58.0                      | 7.616                                    | 30.46                     | 34.27 | 38.08 | 41.89 | 45.69 | 49.50 | 53.31 |
| 117                                | 58.5                      | 7.649                                    | 30.60                     | 34.42 | 38.24 | 42.07 | 45.89 | 49.72 | 53.54 |
| 118                                | 59.0                      | 7.681                                    | 30.72                     | 34.56 | 38.41 | 42.25 | 46.09 | 49.93 | 53.77 |
| 119                                | 59.5                      | 7.714                                    | 30.86                     | 34.71 | 38.57 | 42.43 | 46.28 | 50.14 | 54.00 |
| 120                                | 60.0                      | 7.746                                    | 30.98                     | 34.86 | 38.73 | 42.60 | 46.48 | 50.35 | 54.22 |

**TWO PLY TWIST TABLE**—(Continued)

| No. of<br>Yarn<br>to be<br>Twisted | No. of<br>Twisted<br>Yarn | Sq. Root<br>of No. of<br>Twisted<br>Yarn | TWIST PER INCH            |       |       |       |       |       |       |
|------------------------------------|---------------------------|--|---------------------------|-------|-------|-------|-------|-------|-------|
|                                    |                           |  | Square Root Multiplied by |       |       |       |       |       |       |
|                                    |                           |  | 4                         | 4½    | 5     | 5½    | 6     | 6½    | 7     |
| 121                                | 60.5                      | 7.778                                    | 31.11                     | 35.00 | 38.89 | 42.78 | 46.67 | 50.56 | 54.45 |
| 122                                | 61.0                      | 7.810                                    | 31.24                     | 35.15 | 39.05 | 42.96 | 46.86 | 50.77 | 54.67 |
| 123                                | 61.5                      | 7.842                                    | 31.37                     | 35.29 | 39.21 | 43.13 | 47.05 | 50.97 | 54.89 |
| 124                                | 62.0                      | 7.874                                    | 31.50                     | 35.43 | 39.37 | 43.31 | 47.24 | 51.18 | 55.12 |
| 125                                | 62.5                      | 7.906                                    | 31.62                     | 35.58 | 39.53 | 43.48 | 47.43 | 51.39 | 55.34 |
| 126                                | 63.0                      | 7.937                                    | 31.75                     | 35.72 | 39.69 | 43.65 | 47.62 | 51.59 | 55.56 |
| 127                                | 63.5                      | 7.969                                    | 31.88                     | 35.86 | 39.84 | 43.83 | 47.81 | 51.80 | 55.78 |
| 128                                | 64.0                      | 8.000                                    | 32.00                     | 36.00 | 40.00 | 44.00 | 48.00 | 52.00 | 56.00 |
| 129                                | 64.5                      | 8.031                                    | 32.12                     | 36.14 | 40.16 | 44.17 | 48.19 | 52.20 | 56.22 |
| 130                                | 65.0                      | 8.062                                    | 32.25                     | 36.28 | 40.31 | 44.34 | 48.37 | 52.40 | 56.43 |
| 131                                | 65.5                      | 8.093                                    | 32.37                     | 36.42 | 40.47 | 44.51 | 48.56 | 52.60 | 56.65 |
| 132                                | 66.0                      | 8.124                                    | 32.50                     | 36.56 | 40.62 | 44.68 | 48.74 | 52.81 | 56.87 |
| 133                                | 66.5                      | 8.155                                    | 32.62                     | 36.70 | 40.77 | 44.85 | 48.93 | 53.01 | 57.09 |
| 134                                | 67.0                      | 8.185                                    | 32.74                     | 36.83 | 40.93 | 45.02 | 49.11 | 53.20 | 57.30 |
| 135                                | 67.5                      | 8.216                                    | 32.86                     | 36.97 | 41.08 | 45.19 | 49.30 | 53.40 | 57.51 |
| 136                                | 68.0                      | 8.246                                    | 32.98                     | 37.11 | 41.23 | 45.35 | 49.48 | 53.60 | 57.72 |
| 137                                | 68.5                      | 8.277                                    | 33.11                     | 37.25 | 41.38 | 45.52 | 49.66 | 53.80 | 57.94 |
| 138                                | 69.0                      | 8.307                                    | 33.23                     | 37.38 | 41.53 | 45.69 | 49.84 | 54.00 | 58.15 |
| 139                                | 69.5                      | 8.337                                    | 33.35                     | 37.52 | 41.68 | 45.85 | 50.02 | 54.19 | 58.36 |
| 140                                | 70.0                      | 8.367                                    | 33.47                     | 37.65 | 41.83 | 46.02 | 50.20 | 54.39 | 58.57 |
| 141                                | 70.5                      | 8.396                                    | 33.58                     | 37.78 | 41.98 | 46.18 | 50.38 | 54.57 | 58.77 |
| 142                                | 71.0                      | 8.426                                    | 33.70                     | 37.92 | 42.13 | 46.34 | 50.56 | 54.77 | 58.98 |
| 143                                | 71.5                      | 8.456                                    | 33.82                     | 38.05 | 42.28 | 46.51 | 50.73 | 54.96 | 59.19 |
| 144                                | 72.0                      | 8.485                                    | 33.94                     | 38.18 | 42.43 | 46.67 | 50.91 | 55.15 | 59.40 |
| 145                                | 72.5                      | 8.515                                    | 34.06                     | 38.32 | 42.58 | 46.83 | 51.09 | 55.35 | 59.61 |
| 146                                | 73.0                      | 8.544                                    | 34.18                     | 38.45 | 42.72 | 46.99 | 51.26 | 55.54 | 59.81 |
| 147                                | 73.5                      | 8.573                                    | 34.29                     | 38.58 | 42.87 | 47.15 | 51.44 | 55.72 | 60.01 |
| 148                                | 74.0                      | 8.602                                    | 34.41                     | 38.71 | 43.01 | 47.31 | 51.61 | 55.91 | 60.21 |
| 149                                | 74.5                      | 8.631                                    | 34.52                     | 38.84 | 43.16 | 47.47 | 51.79 | 56.10 | 60.42 |
| 150                                | 75.0                      | 8.660                                    | 34.64                     | 38.97 | 43.30 | 47.63 | 51.96 | 56.29 | 60.62 |
| 151                                | 75.5                      | 8.689                                    | 34.76                     | 39.10 | 43.45 | 47.79 | 52.13 | 56.48 | 60.82 |
| 152                                | 76.0                      | 8.718                                    | 34.87                     | 39.23 | 43.59 | 47.95 | 52.31 | 56.67 | 61.03 |
| 153                                | 76.5                      | 8.746                                    | 34.98                     | 39.36 | 43.73 | 48.10 | 52.48 | 56.85 | 61.22 |
| 154                                | 77.0                      | 8.775                                    | 35.10                     | 39.49 | 43.88 | 48.26 | 52.65 | 57.04 | 61.43 |
| 155                                | 77.5                      | 8.803                                    | 35.21                     | 39.61 | 44.02 | 48.42 | 52.82 | 57.22 | 61.62 |
| 156                                | 78.0                      | 8.832                                    | 35.33                     | 39.74 | 44.16 | 48.58 | 52.99 | 57.41 | 61.82 |
| 157                                | 78.5                      | 8.860                                    | 35.44                     | 39.87 | 44.30 | 48.73 | 53.16 | 57.59 | 62.02 |
| 158                                | 79.0                      | 8.888                                    | 35.55                     | 40.00 | 44.44 | 48.88 | 53.33 | 57.77 | 62.22 |
| 159                                | 79.5                      | 8.916                                    | 35.66                     | 40.12 | 44.58 | 49.04 | 53.50 | 57.95 | 62.41 |
| 160                                | 80.0                      | 8.944                                    | 35.78                     | 40.25 | 44.72 | 49.19 | 53.66 | 58.14 | 62.61 |
| 161                                | 80.5                      | 8.972                                    | 35.89                     | 40.37 | 44.86 | 49.35 | 53.83 | 58.32 | 62.80 |
| 162                                | 81.0                      | 9.000                                    | 36.00                     | 40.50 | 45.00 | 49.50 | 54.00 | 58.50 | 63.00 |
| 163                                | 81.5                      | 9.028                                    | 36.11                     | 40.63 | 45.14 | 49.65 | 54.17 | 58.68 | 63.20 |
| 164                                | 82.0                      | 9.055                                    | 36.22                     | 40.75 | 45.28 | 49.80 | 54.33 | 58.86 | 63.39 |
| 165                                | 82.5                      | 9.083                                    | 36.33                     | 40.87 | 45.42 | 49.96 | 54.50 | 59.04 | 63.58 |
| 166                                | 83.0                      | 9.110                                    | 36.44                     | 41.00 | 45.55 | 50.11 | 54.66 | 59.22 | 63.77 |
| 167                                | 83.5                      | 9.138                                    | 36.55                     | 41.12 | 45.69 | 50.26 | 54.83 | 59.40 | 63.97 |
| 168                                | 84.0                      | 9.165                                    | 36.66                     | 41.24 | 45.83 | 50.41 | 54.99 | 59.57 | 64.16 |
| 169                                | 84.5                      | 9.192                                    | 36.77                     | 41.36 | 45.96 | 50.56 | 55.15 | 59.75 | 64.34 |
| 170                                | 85.0                      | 9.220                                    | 36.88                     | 41.49 | 46.10 | 50.71 | 55.32 | 59.93 | 64.54 |
| 171                                | 85.5                      | 9.247                                    | 36.99                     | 41.61 | 46.24 | 50.86 | 55.48 | 60.11 | 64.73 |
| 172                                | 86.0                      | 9.274                                    | 37.10                     | 41.73 | 46.37 | 51.01 | 55.64 | 60.28 | 64.92 |
| 173                                | 86.5                      | 9.301                                    | 37.20                     | 41.85 | 46.51 | 51.16 | 55.81 | 60.46 | 65.11 |
| 174                                | 87.0                      | 9.327                                    | 37.31                     | 41.97 | 46.64 | 51.30 | 55.96 | 60.63 | 65.29 |
| 175                                | 87.5                      | 9.354                                    | 37.42                     | 42.09 | 46.77 | 51.45 | 56.12 | 60.80 | 65.48 |
| 176                                | 88.0                      | 9.381                                    | 37.52                     | 42.21 | 46.91 | 51.60 | 56.29 | 60.98 | 65.67 |
| 177                                | 88.5                      | 9.407                                    | 37.63                     | 42.33 | 47.04 | 51.74 | 56.44 | 61.15 | 65.85 |
| 178                                | 89.0                      | 9.434                                    | 37.74                     | 42.45 | 47.17 | 51.89 | 56.60 | 61.32 | 66.04 |
| 179                                | 89.5                      | 9.460                                    | 37.84                     | 42.57 | 47.30 | 52.03 | 56.76 | 61.49 | 66.22 |
| 180                                | 90.0                      | 9.487                                    | 37.95                     | 42.69 | 47.44 | 52.18 | 56.92 | 61.67 | 66.41 |

# TWIST TABLE FOR TWISTING

## THREE PLY TWIST TABLE

| No. of<br>Yarn<br>to be<br>Twisted | No. of<br>Twisted<br>Yarn | Sq. Root<br>of No. of<br>Twisted<br>Yarn | TWIST PER INCH            |      |       |       |       |       |       |
|------------------------------------|---------------------------|--|---------------------------|------|-------|-------|-------|-------|-------|
|                                    |                           |  | Square Root Multiplied by |      |       |       |       |       |       |
|                                    |                           |  | 1½                        | 2    | 2½    | 3     | 3½    | 4     | 4½    |
| 1                                  | .33                       | .577                                     | .87                       | 1.15 | 1.44  | 1.73  | 2.02  | 2.31  | 2.60  |
| 2                                  | .67                       | .817                                     | 1.22                      | 1.63 | 2.04  | 2.45  | 2.86  | 3.27  | 3.68  |
| 3                                  | 1.00                      | 1.000                                    | 1.50                      | 2.00 | 2.50  | 3.00  | 3.50  | 4.00  | 4.50  |
| 4                                  | 1.33                      | 1.155                                    | 1.73                      | 2.31 | 2.89  | 3.47  | 4.04  | 4.62  | 5.20  |
| 5                                  | 1.67                      | 1.291                                    | 1.94                      | 2.58 | 3.23  | 3.87  | 4.52  | 5.16  | 5.81  |
| 6                                  | 2.00                      | 1.414                                    | 2.12                      | 2.83 | 3.54  | 4.24  | 4.95  | 5.66  | 6.36  |
| 7                                  | 2.33                      | 1.528                                    | 2.29                      | 3.06 | 3.82  | 4.58  | 5.35  | 6.11  | 6.88  |
| 8                                  | 2.67                      | 1.633                                    | 2.45                      | 3.27 | 4.08  | 4.90  | 5.72  | 6.53  | 7.35  |
| 9                                  | 3.00                      | 1.732                                    | 2.60                      | 3.46 | 4.33  | 5.20  | 6.06  | 6.93  | 7.79  |
| 10                                 | 3.33                      | 1.826                                    | 2.74                      | 3.65 | 4.57  | 5.48  | 6.39  | 7.30  | 8.22  |
| 11                                 | 3.67                      | 1.915                                    | 2.87                      | 3.83 | 4.79  | 5.75  | 6.70  | 7.66  | 8.62  |
| 12                                 | 4.00                      | 2.000                                    | 3.00                      | 4.00 | 5.00  | 6.00  | 7.00  | 8.00  | 9.00  |
| 13                                 | 4.33                      | 2.082                                    | 3.12                      | 4.16 | 5.21  | 6.25  | 7.29  | 8.33  | 9.37  |
| 14                                 | 4.67                      | 2.160                                    | 3.24                      | 4.32 | 5.40  | 6.48  | 7.56  | 8.64  | 9.72  |
| 15                                 | 5.00                      | 2.236                                    | 3.35                      | 4.47 | 5.59  | 6.71  | 7.83  | 8.94  | 10.06 |
| 16                                 | 5.33                      | 2.309                                    | 3.46                      | 4.62 | 5.77  | 6.93  | 8.08  | 9.24  | 10.39 |
| 17                                 | 5.67                      | 2.380                                    | 3.57                      | 4.76 | 5.95  | 7.14  | 8.33  | 9.52  | 10.71 |
| 18                                 | 6.00                      | 2.449                                    | 3.67                      | 4.90 | 6.12  | 7.35  | 8.58  | 9.80  | 11.03 |
| 19                                 | 6.33                      | 2.517                                    | 3.78                      | 5.03 | 6.29  | 7.55  | 8.81  | 10.07 | 11.33 |
| 20                                 | 6.67                      | 2.582                                    | 3.87                      | 5.16 | 6.46  | 7.75  | 9.04  | 10.33 | 11.62 |
| 21                                 | 7.00                      | 2.646                                    | 3.97                      | 5.29 | 6.62  | 7.94  | 9.26  | 10.58 | 11.91 |
| 22                                 | 7.33                      | 2.708                                    | 4.06                      | 5.42 | 6.77  | 8.12  | 9.48  | 10.83 | 12.19 |
| 23                                 | 7.67                      | 2.769                                    | 4.15                      | 5.54 | 6.92  | 8.31  | 9.69  | 11.08 | 12.46 |
| 24                                 | 8.00                      | 2.828                                    | 4.24                      | 5.66 | 7.07  | 8.48  | 9.90  | 11.31 | 12.73 |
| 25                                 | 8.33                      | 2.887                                    | 4.33                      | 5.77 | 7.22  | 8.66  | 10.10 | 11.55 | 12.99 |
| 26                                 | 8.67                      | 2.944                                    | 4.42                      | 5.89 | 7.36  | 8.83  | 10.30 | 11.78 | 13.25 |
| 27                                 | 9.00                      | 3.000                                    | 4.50                      | 6.00 | 7.50  | 9.00  | 10.50 | 12.00 | 13.50 |
| 28                                 | 9.33                      | 3.055                                    | 4.58                      | 6.11 | 7.64  | 9.17  | 10.69 | 12.22 | 13.75 |
| 29                                 | 9.67                      | 3.109                                    | 4.66                      | 6.22 | 7.77  | 9.33  | 10.88 | 12.44 | 13.99 |
| 30                                 | 10.00                     | 3.162                                    | 4.74                      | 6.32 | 7.91  | 9.49  | 11.07 | 12.65 | 14.23 |
| 31                                 | 10.33                     | 3.215                                    | 4.82                      | 6.43 | 8.04  | 9.65  | 11.25 | 12.86 | 14.47 |
| 32                                 | 10.67                     | 3.266                                    | 4.90                      | 6.53 | 8.17  | 9.80  | 11.43 | 13.06 | 14.70 |
| 33                                 | 11.00                     | 3.317                                    | 4.98                      | 6.63 | 8.29  | 9.95  | 11.61 | 13.27 | 14.93 |
| 34                                 | 11.33                     | 3.367                                    | 5.05                      | 6.73 | 8.42  | 10.10 | 11.78 | 13.47 | 15.15 |
| 35                                 | 11.67                     | 3.416                                    | 5.12                      | 6.83 | 8.54  | 10.25 | 11.96 | 13.66 | 15.37 |
| 36                                 | 12.00                     | 3.464                                    | 5.20                      | 6.93 | 8.66  | 10.39 | 12.12 | 13.86 | 15.59 |
| 37                                 | 12.33                     | 3.512                                    | 5.27                      | 7.02 | 8.78  | 10.54 | 12.29 | 14.05 | 15.80 |
| 38                                 | 12.67                     | 3.559                                    | 5.34                      | 7.12 | 8.90  | 10.68 | 12.46 | 14.24 | 16.02 |
| 39                                 | 13.00                     | 3.606                                    | 5.41                      | 7.21 | 9.02  | 10.82 | 12.62 | 14.42 | 16.23 |
| 40                                 | 13.33                     | 3.652                                    | 5.48                      | 7.30 | 9.13  | 10.96 | 12.78 | 14.61 | 16.43 |
| 41                                 | 13.67                     | 3.697                                    | 5.55                      | 7.39 | 9.24  | 11.09 | 12.94 | 14.79 | 16.64 |
| 42                                 | 14.00                     | 3.742                                    | 5.61                      | 7.48 | 9.36  | 11.23 | 13.10 | 14.97 | 16.85 |
| 43                                 | 14.33                     | 3.786                                    | 5.68                      | 7.57 | 9.47  | 11.36 | 13.25 | 15.14 | 17.04 |
| 44                                 | 14.67                     | 3.830                                    | 5.75                      | 7.66 | 9.58  | 11.49 | 13.41 | 15.32 | 17.24 |
| 45                                 | 15.00                     | 3.873                                    | 5.81                      | 7.75 | 9.68  | 11.62 | 13.56 | 15.49 | 17.43 |
| 46                                 | 15.33                     | 3.916                                    | 5.87                      | 7.83 | 9.79  | 11.75 | 13.71 | 15.66 | 17.62 |
| 47                                 | 15.67                     | 3.958                                    | 5.94                      | 7.92 | 9.90  | 11.87 | 13.85 | 15.83 | 17.81 |
| 48                                 | 16.00                     | 4.000                                    | 6.00                      | 8.00 | 10.00 | 12.00 | 14.00 | 16.00 | 18.00 |
| 49                                 | 16.33                     | 4.042                                    | 6.06                      | 8.08 | 10.11 | 12.13 | 14.15 | 16.17 | 18.19 |
| 50                                 | 16.67                     | 4.083                                    | 6.12                      | 8.17 | 10.21 | 12.25 | 14.29 | 16.33 | 18.37 |
| 51                                 | 17.00                     | 4.123                                    | 6.18                      | 8.25 | 10.31 | 12.37 | 14.43 | 16.49 | 18.55 |
| 52                                 | 17.33                     | 4.163                                    | 6.24                      | 8.33 | 10.41 | 12.49 | 14.57 | 16.65 | 18.73 |
| 53                                 | 17.67                     | 4.203                                    | 6.30                      | 8.41 | 10.51 | 12.61 | 14.71 | 16.81 | 18.91 |
| 54                                 | 18.00                     | 4.243                                    | 6.36                      | 8.49 | 10.61 | 12.73 | 14.85 | 16.97 | 19.09 |
| 55                                 | 18.33                     | 4.282                                    | 6.42                      | 8.56 | 10.71 | 12.85 | 14.99 | 17.13 | 19.27 |
| 56                                 | 18.67                     | 4.321                                    | 6.48                      | 8.64 | 10.80 | 12.96 | 15.12 | 17.28 | 19.44 |
| 57                                 | 19.00                     | 4.359                                    | 6.54                      | 8.72 | 10.90 | 13.08 | 15.26 | 17.44 | 19.62 |
| 58                                 | 19.33                     | 4.397                                    | 6.60                      | 8.79 | 10.99 | 13.19 | 15.39 | 17.59 | 19.79 |
| 59                                 | 19.67                     | 4.435                                    | 6.65                      | 8.87 | 11.09 | 13.31 | 15.52 | 17.74 | 19.96 |
| 60                                 | 20.00                     | 4.472                                    | 6.71                      | 8.94 | 11.18 | 13.42 | 15.65 | 17.89 | 20.12 |



# THREE PLY TWIST TABLE—(Cont'd)

| No. of<br>Yarn<br>to be<br>Twisted | No. of<br>Twisted<br>Yarn | Sq. Root<br>of No. of<br>Twisted<br>Yarn | TWIST PER INCH            |       |       |       |       |       |       |
|------------------------------------|---------------------------|--|---------------------------|-------|-------|-------|-------|-------|-------|
|                                    |                           |  | Square Root Multiplied by |       |       |       |       |       |       |
|                                    |                           |  | 5                         | 5½    | 6     | 6½    | 7     | 7½    | 8     |
| 1                                  | .33                       | .577                                     | 2.89                      | 3.17  | 3.46  | 3.75  | 4.04  | 4.33  | 4.62  |
| 2                                  | .67                       | .817                                     | 4.08                      | 4.49  | 4.90  | 5.31  | 5.72  | 6.13  | 6.54  |
| 3                                  | 1.00                      | 1.000                                    | 5.00                      | 5.50  | 6.00  | 6.50  | 7.00  | 7.50  | 8.00  |
| 4                                  | 1.33                      | 1.155                                    | 5.77                      | 6.35  | 6.93  | 7.51  | 8.09  | 8.66  | 9.24  |
| 5                                  | 1.67                      | 1.291                                    | 6.45                      | 7.10  | 7.75  | 8.39  | 9.04  | 9.68  | 10.33 |
| 6                                  | 2.00                      | 1.414                                    | 7.07                      | 7.78  | 8.49  | 9.19  | 9.90  | 10.61 | 11.31 |
| 7                                  | 2.33                      | 1.528                                    | 7.64                      | 8.40  | 9.17  | 9.93  | 10.70 | 11.46 | 12.22 |
| 8                                  | 2.67                      | 1.633                                    | 8.16                      | 8.98  | 9.80  | 10.61 | 11.43 | 12.25 | 13.06 |
| 9                                  | 3.00                      | 1.732                                    | 8.66                      | 9.53  | 10.39 | 11.26 | 12.12 | 12.99 | 13.86 |
| 10                                 | 3.33                      | 1.826                                    | 9.13                      | 10.04 | 10.95 | 11.87 | 12.78 | 13.70 | 14.61 |
| 11                                 | 3.67                      | 1.915                                    | 9.57                      | 10.53 | 11.49 | 12.45 | 13.41 | 14.36 | 15.32 |
| 12                                 | 4.00                      | 2.000                                    | 10.00                     | 11.00 | 12.00 | 13.00 | 14.00 | 15.00 | 16.00 |
| 13                                 | 4.33                      | 2.082                                    | 10.41                     | 11.45 | 12.49 | 13.53 | 14.57 | 15.62 | 16.66 |
| 14                                 | 4.67                      | 2.160                                    | 10.80                     | 11.88 | 12.96 | 14.04 | 15.12 | 16.20 | 17.28 |
| 15                                 | 5.00                      | 2.236                                    | 11.18                     | 12.30 | 13.42 | 14.53 | 15.65 | 16.77 | 17.89 |
| 16                                 | 5.33                      | 2.309                                    | 11.55                     | 12.70 | 13.86 | 15.01 | 16.16 | 17.32 | 18.47 |
| 17                                 | 5.67                      | 2.380                                    | 11.90                     | 13.09 | 14.28 | 15.47 | 16.66 | 17.85 | 19.04 |
| 18                                 | 6.00                      | 2.449                                    | 12.25                     | 13.47 | 14.70 | 15.92 | 17.14 | 18.37 | 19.59 |
| 19                                 | 6.33                      | 2.517                                    | 12.58                     | 13.84 | 15.10 | 16.36 | 17.62 | 18.88 | 20.14 |
| 20                                 | 6.67                      | 2.582                                    | 12.91                     | 14.20 | 15.49 | 16.78 | 18.07 | 19.37 | 20.66 |
| 21                                 | 7.00                      | 2.646                                    | 13.23                     | 14.55 | 15.87 | 17.20 | 18.52 | 19.85 | 21.17 |
| 22                                 | 7.33                      | 2.708                                    | 13.54                     | 14.89 | 16.25 | 17.60 | 18.96 | 20.31 | 21.66 |
| 23                                 | 7.67                      | 2.769                                    | 13.84                     | 15.23 | 16.61 | 18.00 | 19.38 | 20.77 | 22.15 |
| 24                                 | 8.00                      | 2.828                                    | 14.14                     | 15.55 | 16.97 | 18.38 | 19.80 | 21.21 | 22.62 |
| 25                                 | 8.33                      | 2.887                                    | 14.43                     | 15.88 | 17.32 | 18.77 | 20.21 | 21.65 | 23.10 |
| 26                                 | 8.67                      | 2.944                                    | 14.72                     | 16.19 | 17.66 | 19.14 | 20.61 | 22.08 | 23.55 |
| 27                                 | 9.00                      | 3.000                                    | 15.00                     | 16.50 | 18.00 | 19.50 | 21.00 | 22.50 | 24.00 |
| 28                                 | 9.33                      | 3.055                                    | 15.28                     | 16.80 | 18.33 | 19.86 | 21.39 | 22.91 | 24.44 |
| 29                                 | 9.67                      | 3.109                                    | 15.55                     | 17.10 | 18.65 | 20.21 | 21.76 | 23.32 | 24.87 |
| 30                                 | 10.00                     | 3.162                                    | 15.81                     | 17.39 | 18.97 | 20.55 | 22.13 | 23.72 | 25.30 |
| 31                                 | 10.33                     | 3.215                                    | 16.07                     | 17.68 | 19.29 | 20.90 | 22.51 | 24.11 | 25.72 |
| 32                                 | 10.67                     | 3.266                                    | 16.33                     | 17.96 | 19.60 | 21.23 | 22.86 | 24.50 | 26.13 |
| 33                                 | 11.00                     | 3.317                                    | 16.58                     | 18.24 | 19.90 | 21.56 | 23.22 | 24.88 | 26.54 |
| 34                                 | 11.33                     | 3.367                                    | 16.83                     | 18.52 | 20.20 | 21.89 | 23.57 | 25.25 | 26.94 |
| 35                                 | 11.67                     | 3.416                                    | 17.08                     | 18.79 | 20.49 | 22.20 | 23.91 | 25.62 | 27.33 |
| 36                                 | 12.00                     | 3.464                                    | 17.32                     | 19.05 | 20.78 | 22.52 | 24.25 | 25.98 | 27.71 |
| 37                                 | 12.33                     | 3.512                                    | 17.56                     | 19.32 | 21.07 | 22.83 | 24.58 | 26.34 | 28.10 |
| 38                                 | 12.67                     | 3.559                                    | 17.80                     | 19.57 | 21.35 | 23.13 | 24.91 | 26.69 | 28.47 |
| 39                                 | 13.00                     | 3.606                                    | 18.03                     | 19.83 | 21.63 | 23.44 | 25.24 | 27.05 | 28.85 |
| 40                                 | 13.33                     | 3.652                                    | 18.26                     | 20.09 | 21.91 | 23.74 | 25.56 | 27.39 | 29.22 |
| 41                                 | 13.67                     | 3.697                                    | 18.48                     | 20.33 | 22.18 | 24.03 | 25.88 | 27.73 | 29.58 |
| 42                                 | 14.00                     | 3.742                                    | 18.71                     | 20.58 | 22.45 | 24.32 | 26.19 | 28.07 | 29.94 |
| 43                                 | 14.33                     | 3.786                                    | 18.93                     | 20.82 | 22.72 | 24.61 | 26.50 | 28.40 | 30.29 |
| 44                                 | 14.67                     | 3.830                                    | 19.15                     | 21.07 | 22.98 | 24.90 | 26.81 | 28.73 | 30.64 |
| 45                                 | 15.00                     | 3.873                                    | 19.36                     | 21.30 | 23.24 | 25.17 | 27.11 | 29.05 | 30.98 |
| 46                                 | 15.33                     | 3.916                                    | 19.58                     | 21.54 | 23.49 | 25.45 | 27.41 | 29.37 | 31.33 |
| 47                                 | 15.67                     | 3.958                                    | 19.79                     | 21.77 | 23.75 | 25.73 | 27.71 | 29.69 | 31.66 |
| 48                                 | 16.00                     | 4.000                                    | 20.00                     | 22.00 | 24.00 | 26.00 | 28.00 | 30.00 | 32.00 |
| 49                                 | 16.33                     | 4.042                                    | 20.21                     | 22.23 | 24.25 | 26.27 | 28.29 | 30.32 | 32.34 |
| 50                                 | 16.67                     | 4.083                                    | 20.41                     | 22.46 | 24.50 | 26.54 | 28.58 | 30.62 | 32.66 |
| 51                                 | 17.00                     | 4.123                                    | 20.62                     | 22.68 | 24.74 | 26.80 | 28.86 | 30.92 | 32.98 |
| 52                                 | 17.33                     | 4.163                                    | 20.82                     | 22.90 | 24.98 | 27.06 | 29.14 | 31.22 | 33.30 |
| 53                                 | 17.67                     | 4.203                                    | 21.02                     | 23.12 | 25.22 | 27.32 | 29.42 | 31.52 | 33.62 |
| 54                                 | 18.00                     | 4.243                                    | 21.21                     | 23.33 | 25.46 | 27.58 | 29.70 | 31.82 | 33.94 |
| 55                                 | 18.33                     | 4.282                                    | 21.41                     | 23.55 | 25.69 | 27.83 | 29.97 | 32.12 | 34.26 |
| 56                                 | 18.67                     | 4.321                                    | 21.60                     | 23.77 | 25.93 | 28.09 | 30.25 | 32.41 | 34.57 |
| 57                                 | 19.00                     | 4.359                                    | 21.79                     | 23.97 | 26.15 | 28.33 | 30.51 | 32.69 | 34.87 |
| 58                                 | 19.33                     | 4.397                                    | 21.98                     | 24.18 | 26.38 | 28.58 | 30.78 | 32.98 | 35.18 |
| 59                                 | 19.67                     | 4.435                                    | 22.17                     | 24.39 | 26.61 | 28.83 | 31.05 | 33.26 | 35.48 |
| 60                                 | 20.00                     | 4.472                                    | 22.36                     | 24.60 | 26.83 | 29.07 | 31.30 | 33.54 | 35.78 |

# THREE PLY TWIST TABLE—(Cont'd)

| No. of<br>Yarn<br>to be<br>Twisted | No. of<br>Twisted<br>Yarn | Sq. Root<br>of No. of<br>Twisted<br>Yarn | TWIST PER INCH            |       |       |       |       |       |       |
|------------------------------------|---------------------------|--|---------------------------|-------|-------|-------|-------|-------|-------|
|                                    |                           |  | Square Root Multiplied by |       |       |       |       |       |       |
|                                    |                           |  | 4                         | 4½    | 5     | 5½    | 6     | 6½    | 7     |
| 61                                 | 20.33                     | 4.509                                    | 18.04                     | 20.29 | 22.55 | 24.80 | 27.05 | 29.31 | 31.56 |
| 62                                 | 20.67                     | 4.546                                    | 18.18                     | 20.46 | 22.73 | 25.00 | 27.28 | 29.55 | 31.82 |
| 63                                 | 21.00                     | 4.583                                    | 18.33                     | 20.62 | 22.91 | 25.21 | 27.50 | 29.79 | 32.08 |
| 64                                 | 21.33                     | 4.619                                    | 18.48                     | 20.79 | 23.09 | 25.40 | 27.71 | 30.02 | 32.33 |
| 65                                 | 21.67                     | 4.655                                    | 18.62                     | 20.95 | 23.27 | 25.60 | 27.93 | 30.26 | 32.59 |
| 66                                 | 22.00                     | 4.690                                    | 18.76                     | 21.11 | 23.45 | 25.80 | 28.14 | 30.49 | 32.83 |
| 67                                 | 22.33                     | 4.726                                    | 18.90                     | 21.27 | 23.63 | 25.99 | 28.35 | 30.72 | 33.08 |
| 68                                 | 22.67                     | 4.761                                    | 19.04                     | 21.42 | 23.80 | 26.19 | 28.57 | 30.95 | 33.33 |
| 69                                 | 23.00                     | 4.796                                    | 19.18                     | 21.58 | 23.98 | 26.38 | 28.78 | 31.17 | 33.57 |
| 70                                 | 23.33                     | 4.831                                    | 19.32                     | 21.74 | 24.15 | 26.57 | 28.99 | 31.40 | 33.82 |
| 71                                 | 23.67                     | 4.865                                    | 19.46                     | 21.89 | 24.32 | 26.76 | 29.19 | 31.62 | 34.06 |
| 72                                 | 24.00                     | 4.899                                    | 19.60                     | 22.05 | 24.49 | 26.94 | 29.39 | 31.84 | 34.29 |
| 73                                 | 24.33                     | 4.933                                    | 19.73                     | 22.20 | 24.66 | 27.13 | 29.60 | 32.06 | 34.53 |
| 74                                 | 24.67                     | 4.967                                    | 19.87                     | 22.35 | 24.83 | 27.32 | 29.80 | 32.29 | 34.77 |
| 75                                 | 25.00                     | 5.000                                    | 20.00                     | 22.50 | 25.00 | 27.50 | 30.00 | 32.50 | 35.00 |
| 76                                 | 25.33                     | 5.033                                    | 20.13                     | 22.65 | 25.17 | 27.68 | 30.20 | 32.71 | 35.23 |
| 77                                 | 25.67                     | 5.066                                    | 20.26                     | 22.80 | 25.33 | 27.86 | 30.40 | 32.93 | 35.46 |
| 78                                 | 26.00                     | 5.099                                    | 20.40                     | 22.95 | 25.50 | 28.04 | 30.59 | 33.14 | 35.69 |
| 79                                 | 26.33                     | 5.132                                    | 20.53                     | 23.09 | 25.66 | 28.23 | 30.79 | 33.36 | 35.92 |
| 80                                 | 26.67                     | 5.164                                    | 20.66                     | 23.24 | 25.82 | 28.40 | 30.98 | 33.57 | 36.15 |
| 81                                 | 27.00                     | 5.196                                    | 20.78                     | 23.38 | 25.98 | 28.58 | 31.18 | 33.77 | 36.37 |
| 82                                 | 27.33                     | 5.228                                    | 20.91                     | 23.53 | 26.14 | 28.75 | 31.37 | 33.98 | 36.60 |
| 83                                 | 27.67                     | 5.260                                    | 21.04                     | 23.67 | 26.30 | 28.93 | 31.56 | 34.19 | 36.82 |
| 84                                 | 28.00                     | 5.292                                    | 21.17                     | 23.81 | 26.46 | 29.11 | 31.75 | 34.40 | 37.04 |
| 85                                 | 28.33                     | 5.323                                    | 21.29                     | 23.95 | 26.61 | 29.28 | 31.94 | 34.60 | 37.26 |
| 86                                 | 28.67                     | 5.354                                    | 21.42                     | 24.09 | 26.77 | 29.45 | 32.12 | 34.80 | 37.48 |
| 87                                 | 29.00                     | 5.385                                    | 21.54                     | 24.23 | 26.93 | 29.62 | 32.31 | 35.00 | 37.70 |
| 88                                 | 29.33                     | 5.416                                    | 21.66                     | 24.37 | 27.08 | 29.79 | 32.50 | 35.20 | 37.91 |
| 89                                 | 29.67                     | 5.447                                    | 21.79                     | 24.51 | 27.23 | 29.96 | 32.68 | 35.41 | 38.13 |
| 90                                 | 30.00                     | 5.477                                    | 21.91                     | 24.65 | 27.39 | 30.12 | 32.86 | 35.60 | 38.34 |
| 91                                 | 30.33                     | 5.508                                    | 22.03                     | 24.79 | 27.54 | 30.29 | 33.05 | 35.80 | 38.56 |
| 92                                 | 30.67                     | 5.538                                    | 22.15                     | 24.92 | 27.69 | 30.46 | 33.23 | 36.00 | 38.77 |
| 93                                 | 31.00                     | 5.568                                    | 22.27                     | 25.06 | 27.84 | 30.62 | 33.41 | 36.19 | 38.98 |
| 94                                 | 31.33                     | 5.598                                    | 22.39                     | 25.19 | 27.99 | 30.79 | 33.59 | 36.39 | 39.19 |
| 95                                 | 31.67                     | 5.627                                    | 22.51                     | 25.32 | 28.14 | 30.95 | 33.76 | 36.58 | 39.39 |
| 96                                 | 32.00                     | 5.657                                    | 22.63                     | 25.46 | 28.28 | 31.11 | 33.94 | 36.77 | 39.60 |
| 97                                 | 32.33                     | 5.686                                    | 22.74                     | 25.59 | 28.43 | 31.27 | 34.12 | 36.96 | 39.80 |
| 98                                 | 32.67                     | 5.716                                    | 22.86                     | 25.72 | 28.58 | 31.44 | 34.30 | 37.15 | 40.01 |
| 99                                 | 33.00                     | 5.745                                    | 22.98                     | 25.85 | 28.72 | 31.60 | 34.47 | 37.34 | 40.22 |
| 100                                | 33.33                     | 5.774                                    | 23.10                     | 25.98 | 28.87 | 31.76 | 34.64 | 37.53 | 40.42 |
| 101                                | 33.67                     | 5.802                                    | 23.21                     | 26.11 | 29.01 | 31.91 | 34.81 | 37.71 | 40.61 |
| 102                                | 34.00                     | 5.831                                    | 23.32                     | 26.24 | 29.15 | 32.07 | 34.99 | 37.90 | 40.82 |
| 103                                | 34.33                     | 5.860                                    | 23.44                     | 26.37 | 29.30 | 32.23 | 35.16 | 38.09 | 41.02 |
| 104                                | 34.67                     | 5.888                                    | 23.55                     | 26.50 | 29.44 | 32.38 | 35.33 | 38.27 | 41.22 |
| 105                                | 35.00                     | 5.916                                    | 23.66                     | 26.62 | 29.58 | 32.54 | 35.50 | 38.45 | 41.41 |
| 106                                | 35.33                     | 5.944                                    | 23.78                     | 26.75 | 29.72 | 32.69 | 35.67 | 38.64 | 41.61 |
| 107                                | 35.67                     | 5.972                                    | 23.89                     | 26.87 | 29.86 | 32.85 | 35.83 | 38.82 | 41.80 |
| 108                                | 36.00                     | 6.000                                    | 24.00                     | 27.00 | 30.00 | 33.00 | 36.00 | 39.00 | 42.00 |
| 109                                | 36.33                     | 6.028                                    | 24.11                     | 27.13 | 30.14 | 33.15 | 36.17 | 39.18 | 42.20 |
| 110                                | 36.67                     | 6.055                                    | 24.22                     | 27.25 | 30.28 | 33.30 | 36.33 | 39.36 | 42.39 |
| 111                                | 37.00                     | 6.083                                    | 24.33                     | 27.37 | 30.41 | 33.46 | 36.50 | 39.54 | 42.58 |
| 112                                | 37.33                     | 6.110                                    | 24.44                     | 27.50 | 30.55 | 33.61 | 36.66 | 39.72 | 42.77 |
| 113                                | 37.67                     | 6.137                                    | 24.55                     | 27.62 | 30.69 | 33.75 | 36.82 | 39.89 | 42.96 |
| 114                                | 38.00                     | 6.164                                    | 24.66                     | 27.74 | 30.82 | 33.90 | 36.99 | 40.07 | 43.15 |
| 115                                | 38.33                     | 6.191                                    | 24.76                     | 27.86 | 30.96 | 34.05 | 37.15 | 40.24 | 43.34 |
| 116                                | 38.67                     | 6.218                                    | 24.87                     | 27.98 | 31.09 | 34.20 | 37.31 | 40.42 | 43.53 |
| 117                                | 39.00                     | 6.245                                    | 24.98                     | 28.10 | 31.22 | 34.35 | 37.47 | 40.59 | 43.72 |
| 118                                | 39.33                     | 6.272                                    | 25.09                     | 28.22 | 31.36 | 34.50 | 37.63 | 40.77 | 43.90 |
| 119                                | 39.67                     | 6.298                                    | 25.19                     | 28.34 | 31.49 | 34.64 | 37.79 | 40.94 | 44.09 |
| 120                                | 40.00                     | 6.325                                    | 25.30                     | 28.46 | 31.62 | 34.79 | 37.95 | 41.11 | 44.28 |



**THREE PLY TWIST TABLE**—(Cont'd)

| No. of<br>Yarn<br>to be<br>Twisted | No. of<br>Twisted<br>Yarn | Sq. Root<br>of No. of<br>Twisted<br>Yarn | TWIST PER INCH            |       |       |       |       |       |       |
|------------------------------------|---------------------------|--|---------------------------|-------|-------|-------|-------|-------|-------|
|                                    |                           |  | Square Root Multiplied by |       |       |       |       |       |       |
|                                    |                           |  | 4                         | 4½    | 5     | 5½    | 6     | 6½    | 7     |
| 121                                | 40.33                     | 6.351                                    | 25.40                     | 28.58 | 31.76 | 34.93 | 38.11 | 41.28 | 44.46 |
| 122                                | 40.67                     | 6.377                                    | 25.51                     | 28.70 | 31.89 | 35.07 | 38.26 | 41.45 | 44.64 |
| 123                                | 41.00                     | 6.403                                    | 25.61                     | 28.81 | 32.02 | 35.22 | 38.42 | 41.62 | 44.82 |
| 124                                | 41.33                     | 6.429                                    | 25.72                     | 28.93 | 32.15 | 35.36 | 38.57 | 41.79 | 45.00 |
| 125                                | 41.67                     | 6.455                                    | 25.82                     | 29.05 | 32.28 | 35.50 | 38.73 | 41.96 | 45.19 |
| 126                                | 42.00                     | 6.481                                    | 25.92                     | 29.16 | 32.41 | 35.65 | 38.89 | 42.13 | 45.37 |
| 127                                | 42.33                     | 6.506                                    | 26.02                     | 29.28 | 32.53 | 35.78 | 39.04 | 42.29 | 45.54 |
| 128                                | 42.67                     | 6.532                                    | 26.13                     | 29.39 | 32.66 | 35.93 | 39.19 | 42.46 | 45.72 |
| 129                                | 43.00                     | 6.557                                    | 26.23                     | 29.51 | 32.79 | 36.06 | 39.34 | 42.62 | 45.90 |
| 130                                | 43.33                     | 6.583                                    | 26.33                     | 29.62 | 32.92 | 36.21 | 39.50 | 42.79 | 46.08 |
| 131                                | 43.67                     | 6.608                                    | 26.43                     | 29.74 | 33.04 | 36.34 | 39.65 | 42.95 | 46.26 |
| 132                                | 44.00                     | 6.633                                    | 26.53                     | 29.85 | 33.17 | 36.48 | 39.80 | 43.11 | 46.43 |
| 133                                | 44.33                     | 6.658                                    | 26.63                     | 29.96 | 33.29 | 36.62 | 39.95 | 43.28 | 46.61 |
| 134                                | 44.67                     | 6.683                                    | 26.73                     | 30.07 | 33.42 | 36.76 | 40.10 | 43.44 | 46.78 |
| 135                                | 45.00                     | 6.708                                    | 26.83                     | 30.19 | 33.54 | 36.89 | 40.25 | 43.60 | 46.96 |
| 136                                | 45.33                     | 6.733                                    | 26.93                     | 30.30 | 33.67 | 37.03 | 40.40 | 43.76 | 47.13 |
| 137                                | 45.67                     | 6.758                                    | 27.03                     | 30.41 | 33.79 | 37.17 | 40.55 | 43.93 | 47.31 |
| 138                                | 46.00                     | 6.782                                    | 27.13                     | 30.52 | 33.91 | 37.30 | 40.69 | 44.08 | 47.47 |
| 139                                | 46.33                     | 6.807                                    | 27.23                     | 30.63 | 34.04 | 37.44 | 40.84 | 44.25 | 47.65 |
| 140                                | 46.67                     | 6.831                                    | 27.32                     | 30.74 | 34.16 | 37.57 | 40.99 | 44.40 | 47.82 |
| 141                                | 47.00                     | 6.856                                    | 27.42                     | 30.85 | 34.28 | 37.71 | 41.14 | 44.56 | 47.99 |
| 142                                | 47.33                     | 6.880                                    | 27.52                     | 30.96 | 34.40 | 37.84 | 41.28 | 44.72 | 48.16 |
| 143                                | 47.67                     | 6.904                                    | 27.62                     | 31.07 | 34.52 | 37.97 | 41.42 | 44.88 | 48.33 |
| 144                                | 48.00                     | 6.928                                    | 27.71                     | 31.18 | 34.64 | 38.10 | 41.57 | 45.04 | 48.50 |
| 145                                | 48.33                     | 6.952                                    | 27.81                     | 31.28 | 34.76 | 38.24 | 41.71 | 45.19 | 48.66 |
| 146                                | 48.67                     | 6.976                                    | 27.90                     | 31.39 | 34.88 | 38.37 | 41.86 | 45.34 | 48.83 |
| 147                                | 49.00                     | 7.000                                    | 28.00                     | 31.50 | 35.00 | 38.50 | 42.00 | 45.50 | 49.00 |
| 148                                | 49.33                     | 7.024                                    | 28.10                     | 31.61 | 35.12 | 38.63 | 42.14 | 45.66 | 49.17 |
| 149                                | 49.67                     | 7.048                                    | 28.19                     | 31.72 | 35.24 | 38.76 | 42.29 | 45.81 | 49.34 |
| 150                                | 50.00                     | 7.071                                    | 28.28                     | 31.82 | 35.36 | 38.89 | 42.43 | 45.96 | 49.50 |
| 151                                | 50.33                     | 7.095                                    | 28.38                     | 31.93 | 35.48 | 39.02 | 42.57 | 46.12 | 49.67 |
| 152                                | 50.67                     | 7.118                                    | 28.47                     | 32.03 | 35.59 | 39.15 | 42.71 | 46.27 | 49.83 |
| 153                                | 51.00                     | 7.142                                    | 28.57                     | 32.14 | 35.71 | 39.28 | 42.85 | 46.42 | 49.99 |
| 154                                | 51.33                     | 7.165                                    | 28.66                     | 32.24 | 35.83 | 39.41 | 42.99 | 46.57 | 50.16 |
| 155                                | 51.67                     | 7.188                                    | 28.75                     | 32.35 | 35.94 | 39.53 | 43.13 | 46.72 | 50.32 |
| 156                                | 52.00                     | 7.211                                    | 28.84                     | 32.45 | 36.06 | 39.66 | 43.27 | 46.87 | 50.48 |
| 157                                | 52.33                     | 7.234                                    | 28.94                     | 32.55 | 36.17 | 39.79 | 43.40 | 47.02 | 50.64 |
| 158                                | 52.67                     | 7.257                                    | 29.03                     | 32.66 | 36.29 | 39.91 | 43.54 | 47.17 | 50.80 |
| 159                                | 53.00                     | 7.280                                    | 29.12                     | 32.76 | 36.40 | 40.04 | 43.68 | 47.32 | 50.96 |
| 160                                | 53.33                     | 7.303                                    | 29.21                     | 32.86 | 36.52 | 40.17 | 43.82 | 47.47 | 51.12 |
| 161                                | 53.67                     | 7.326                                    | 29.30                     | 32.97 | 36.63 | 40.29 | 43.96 | 47.62 | 51.28 |
| 162                                | 54.00                     | 7.348                                    | 29.39                     | 33.07 | 36.74 | 40.41 | 44.09 | 47.76 | 51.44 |
| 163                                | 54.33                     | 7.371                                    | 29.48                     | 33.17 | 36.86 | 40.54 | 44.23 | 47.91 | 51.60 |
| 164                                | 54.67                     | 7.394                                    | 29.58                     | 33.27 | 36.97 | 40.67 | 44.36 | 48.06 | 51.76 |
| 165                                | 55.00                     | 7.417                                    | 29.67                     | 33.38 | 37.09 | 40.79 | 44.50 | 48.21 | 51.92 |
| 166                                | 55.33                     | 7.439                                    | 29.76                     | 33.48 | 37.20 | 40.91 | 44.63 | 48.35 | 52.07 |
| 167                                | 55.67                     | 7.461                                    | 29.84                     | 33.57 | 37.31 | 41.04 | 44.77 | 48.50 | 52.23 |
| 168                                | 56.00                     | 7.483                                    | 29.93                     | 33.67 | 37.42 | 41.16 | 44.90 | 48.64 | 52.38 |
| 169                                | 56.33                     | 7.506                                    | 30.02                     | 33.78 | 37.53 | 41.28 | 45.04 | 48.79 | 52.54 |
| 170                                | 56.67                     | 7.528                                    | 30.11                     | 33.88 | 37.64 | 41.40 | 45.17 | 48.93 | 52.70 |
| 171                                | 57.00                     | 7.550                                    | 30.20                     | 33.98 | 37.75 | 41.53 | 45.30 | 49.08 | 52.85 |
| 172                                | 57.33                     | 7.572                                    | 30.29                     | 34.07 | 37.86 | 41.65 | 45.43 | 49.22 | 53.00 |
| 173                                | 57.67                     | 7.594                                    | 30.38                     | 34.17 | 37.97 | 41.77 | 45.56 | 49.36 | 53.16 |
| 174                                | 58.00                     | 7.616                                    | 30.46                     | 34.27 | 38.08 | 41.89 | 45.70 | 49.50 | 53.31 |
| 175                                | 58.33                     | 7.638                                    | 30.55                     | 34.37 | 38.19 | 42.01 | 45.83 | 49.65 | 53.47 |
| 176                                | 58.67                     | 7.659                                    | 30.64                     | 34.47 | 38.30 | 42.12 | 45.95 | 49.78 | 53.61 |
| 177                                | 59.00                     | 7.681                                    | 30.72                     | 34.56 | 38.41 | 42.25 | 46.09 | 49.93 | 53.77 |
| 178                                | 59.33                     | 7.703                                    | 30.81                     | 34.66 | 38.52 | 42.37 | 46.22 | 50.07 | 53.92 |
| 179                                | 59.67                     | 7.724                                    | 30.90                     | 34.76 | 38.62 | 42.48 | 46.34 | 50.21 | 54.07 |
| 180                                | 60.00                     | 7.746                                    | 30.98                     | 34.86 | 38.73 | 42.60 | 46.48 | 50.35 | 54.22 |

# FOUR PLY TWIST TABLE

| No. of<br>Yarn<br>to be<br>Twisted | No. of<br>Twisted<br>Yarn | Sq. Root<br>of No. of<br>Twisted<br>Yarn | TWIST PER INCH            |      |                |       |                |       |                |
|------------------------------------|---------------------------|--|---------------------------|------|----------------|-------|----------------|-------|----------------|
|                                    |                           |  | Square Root Multiplied by |      |                |       |                |       |                |
|                                    |                           |  | $1\frac{1}{2}$            | 2    | $2\frac{1}{2}$ | 3     | $3\frac{1}{2}$ | 4     | $4\frac{1}{2}$ |
| 1                                  | .25                       | .500                                     | .75                       | 1.00 | 1.25           | 1.50  | 1.75           | 2.00  | 2.25           |
| 2                                  | .50                       | .707                                     | 1.06                      | 1.41 | 1.77           | 2.12  | 2.47           | 2.83  | 3.18           |
| 3                                  | .75                       | .866                                     | 1.30                      | 1.73 | 2.17           | 2.60  | 3.03           | 3.46  | 3.90           |
| 4                                  | 1.00                      | 1.000                                    | 1.50                      | 2.00 | 2.50           | 3.00  | 3.50           | 4.00  | 4.50           |
| 5                                  | 1.25                      | 1.118                                    | 1.68                      | 2.24 | 2.80           | 3.35  | 3.91           | 4.47  | 5.03           |
| 6                                  | 1.50                      | 1.225                                    | 1.84                      | 2.45 | 3.06           | 3.68  | 4.29           | 4.90  | 5.51           |
| 7                                  | 1.75                      | 1.323                                    | 1.98                      | 2.65 | 3.31           | 3.97  | 4.63           | 5.29  | 5.95           |
| 8                                  | 2.00                      | 1.414                                    | 2.12                      | 2.83 | 3.54           | 4.24  | 4.95           | 5.66  | 6.36           |
| 9                                  | 2.25                      | 1.500                                    | 2.25                      | 3.00 | 3.75           | 4.50  | 5.25           | 6.00  | 6.75           |
| 10                                 | 2.50                      | 1.581                                    | 2.37                      | 3.16 | 3.95           | 4.74  | 5.53           | 6.32  | 7.11           |
| 11                                 | 2.75                      | 1.658                                    | 2.49                      | 3.32 | 4.15           | 4.97  | 5.80           | 6.63  | 7.46           |
| 12                                 | 3.00                      | 1.732                                    | 2.60                      | 3.46 | 4.33           | 5.20  | 6.06           | 6.93  | 7.79           |
| 13                                 | 3.25                      | 1.803                                    | 2.70                      | 3.61 | 4.51           | 5.41  | 6.31           | 7.21  | 8.11           |
| 14                                 | 3.50                      | 1.871                                    | 2.81                      | 3.74 | 4.68           | 5.61  | 6.55           | 7.48  | 8.42           |
| 15                                 | 3.75                      | 1.936                                    | 2.91                      | 3.87 | 4.84           | 5.81  | 6.78           | 7.74  | 8.71           |
| 16                                 | 4.00                      | 2.000                                    | 3.00                      | 4.00 | 5.00           | 6.00  | 7.00           | 8.00  | 9.00           |
| 17                                 | 4.25                      | 2.062                                    | 3.09                      | 4.12 | 5.16           | 6.19  | 7.22           | 8.25  | 9.28           |
| 18                                 | 4.50                      | 2.121                                    | 3.18                      | 4.24 | 5.30           | 6.36  | 7.42           | 8.48  | 9.54           |
| 19                                 | 4.75                      | 2.179                                    | 3.27                      | 4.36 | 5.45           | 6.54  | 7.63           | 8.72  | 9.81           |
| 20                                 | 5.00                      | 2.236                                    | 3.35                      | 4.47 | 5.59           | 6.71  | 7.83           | 8.94  | 10.06          |
| 21                                 | 5.25                      | 2.291                                    | 3.44                      | 4.58 | 5.73           | 6.87  | 8.02           | 9.17  | 10.31          |
| 22                                 | 5.50                      | 2.345                                    | 3.52                      | 4.69 | 5.86           | 7.04  | 8.21           | 9.38  | 10.55          |
| 23                                 | 5.75                      | 2.398                                    | 3.60                      | 4.80 | 6.00           | 7.19  | 8.39           | 9.59  | 10.79          |
| 24                                 | 6.00                      | 2.449                                    | 3.68                      | 4.90 | 6.13           | 7.35  | 8.58           | 9.80  | 11.03          |
| 25                                 | 6.25                      | 2.500                                    | 3.75                      | 5.00 | 6.25           | 7.50  | 8.75           | 10.00 | 11.25          |
| 26                                 | 6.50                      | 2.550                                    | 3.83                      | 5.10 | 6.38           | 7.65  | 8.93           | 10.20 | 11.48          |
| 27                                 | 6.75                      | 2.598                                    | 3.90                      | 5.20 | 6.50           | 7.79  | 9.09           | 10.39 | 11.69          |
| 28                                 | 7.00                      | 2.646                                    | 3.97                      | 5.29 | 6.62           | 7.94  | 9.26           | 10.58 | 11.91          |
| 29                                 | 7.25                      | 2.693                                    | 4.04                      | 5.39 | 6.73           | 8.08  | 9.43           | 10.77 | 12.12          |
| 30                                 | 7.50                      | 2.739                                    | 4.11                      | 5.48 | 6.85           | 8.22  | 9.59           | 10.96 | 12.33          |
| 31                                 | 7.75                      | 2.784                                    | 4.18                      | 5.57 | 6.96           | 8.35  | 9.74           | 11.14 | 12.53          |
| 32                                 | 8.00                      | 2.828                                    | 4.24                      | 5.66 | 7.07           | 8.48  | 9.90           | 11.31 | 12.73          |
| 33                                 | 8.25                      | 2.872                                    | 4.31                      | 5.74 | 7.18           | 8.62  | 10.05          | 11.49 | 12.92          |
| 34                                 | 8.50                      | 2.915                                    | 4.37                      | 5.83 | 7.29           | 8.75  | 10.21          | 11.66 | 13.12          |
| 35                                 | 8.75                      | 2.958                                    | 4.44                      | 5.92 | 7.40           | 8.87  | 10.35          | 11.83 | 13.31          |
| 36                                 | 9.00                      | 3.000                                    | 4.50                      | 6.00 | 7.50           | 9.00  | 10.50          | 12.00 | 13.50          |
| 37                                 | 9.25                      | 3.041                                    | 4.56                      | 6.08 | 7.60           | 9.12  | 10.64          | 12.16 | 13.68          |
| 38                                 | 9.50                      | 3.082                                    | 4.62                      | 6.16 | 7.71           | 9.25  | 10.79          | 12.33 | 13.87          |
| 39                                 | 9.75                      | 3.123                                    | 4.68                      | 6.25 | 7.81           | 9.37  | 10.93          | 12.49 | 14.05          |
| 40                                 | 10.00                     | 3.162                                    | 4.74                      | 6.32 | 7.91           | 9.49  | 11.07          | 12.65 | 14.23          |
| 41                                 | 10.25                     | 3.202                                    | 4.80                      | 6.40 | 8.01           | 9.61  | 11.21          | 12.81 | 14.41          |
| 42                                 | 10.50                     | 3.240                                    | 4.86                      | 6.48 | 8.10           | 9.72  | 11.34          | 12.96 | 14.58          |
| 43                                 | 10.75                     | 3.279                                    | 4.92                      | 6.56 | 8.20           | 9.84  | 11.48          | 13.12 | 14.76          |
| 44                                 | 11.00                     | 3.317                                    | 4.98                      | 6.63 | 8.29           | 9.95  | 11.61          | 13.27 | 14.93          |
| 45                                 | 11.25                     | 3.354                                    | 5.03                      | 6.71 | 8.39           | 10.06 | 11.74          | 13.42 | 15.09          |
| 46                                 | 11.50                     | 3.391                                    | 5.09                      | 6.78 | 8.48           | 10.17 | 11.87          | 13.56 | 15.26          |
| 47                                 | 11.75                     | 3.428                                    | 5.14                      | 6.86 | 8.57           | 10.28 | 12.00          | 13.71 | 15.43          |
| 48                                 | 12.00                     | 3.464                                    | 5.20                      | 6.93 | 8.66           | 10.39 | 12.12          | 13.86 | 15.59          |
| 49                                 | 12.25                     | 3.500                                    | 5.25                      | 7.00 | 8.75           | 10.50 | 12.25          | 14.00 | 15.75          |
| 50                                 | 12.50                     | 3.536                                    | 5.30                      | 7.07 | 8.84           | 10.61 | 12.38          | 14.14 | 15.91          |
| 51                                 | 12.75                     | 3.571                                    | 5.36                      | 7.14 | 8.93           | 10.71 | 12.50          | 14.28 | 16.07          |
| 52                                 | 13.00                     | 3.606                                    | 5.41                      | 7.21 | 9.02           | 10.82 | 12.62          | 14.42 | 16.23          |
| 53                                 | 13.25                     | 3.640                                    | 5.46                      | 7.28 | 9.10           | 10.92 | 12.74          | 14.56 | 16.38          |
| 54                                 | 13.50                     | 3.674                                    | 5.51                      | 7.35 | 9.19           | 11.02 | 12.86          | 14.70 | 16.53          |
| 55                                 | 13.75                     | 3.708                                    | 5.56                      | 7.42 | 9.27           | 11.12 | 12.98          | 14.83 | 16.69          |
| 56                                 | 14.00                     | 3.742                                    | 5.61                      | 7.48 | 9.36           | 11.23 | 13.10          | 14.97 | 16.84          |
| 57                                 | 14.25                     | 3.775                                    | 5.66                      | 7.55 | 9.44           | 11.33 | 13.21          | 15.10 | 16.99          |
| 58                                 | 14.50                     | 3.808                                    | 5.71                      | 7.62 | 9.52           | 11.42 | 13.33          | 15.23 | 17.14          |
| 59                                 | 14.75                     | 3.841                                    | 5.76                      | 7.68 | 9.60           | 11.52 | 13.44          | 15.36 | 17.28          |
| 60                                 | 15.00                     | 3.873                                    | 5.81                      | 7.75 | 9.68           | 11.62 | 13.56          | 15.49 | 17.43          |

# FOUR PLY TWIST TABLE—(Continued)

| No. of<br>Yarn<br>to be<br>Twisted | No. of<br>Twisted<br>Yarn | Sq. Root<br>of No. of<br>Twisted<br>Yarn | TWIST PER INCH            |       |       |       |       |       |       |
|------------------------------------|---------------------------|--|---------------------------|-------|-------|-------|-------|-------|-------|
|                                    |                           |  | Square Root Multiplied by |       |       |       |       |       |       |
|                                    |                           |  | 5                         | 5½    | 6     | 6½    | 7     | 7½    | 8     |
| 1                                  | .25                       | .500                                     | 2.50                      | 2.75  | 3.00  | 3.25  | 3.50  | 3.75  | 4.00  |
| 2                                  | .50                       | .707                                     | 3.54                      | 3.89  | 4.24  | 4.60  | 4.95  | 5.30  | 5.66  |
| 3                                  | .75                       | .866                                     | 4.33                      | 4.76  | 5.20  | 5.63  | 6.06  | 6.50  | 6.93  |
| 4                                  | 1.00                      | 1.000                                    | 5.00                      | 5.50  | 6.00  | 6.50  | 7.00  | 7.50  | 8.00  |
| 5                                  | 1.25                      | 1.118                                    | 5.59                      | 6.15  | 6.71  | 7.27  | 7.83  | 8.39  | 8.94  |
| 6                                  | 1.50                      | 1.225                                    | 6.12                      | 6.74  | 7.35  | 7.96  | 8.58  | 9.19  | 9.80  |
| 7                                  | 1.75                      | 1.323                                    | 6.61                      | 7.28  | 7.94  | 8.60  | 9.26  | 9.92  | 10.58 |
| 8                                  | 2.00                      | 1.414                                    | 7.07                      | 7.78  | 8.49  | 9.19  | 9.90  | 10.61 | 11.31 |
| 9                                  | 2.25                      | 1.500                                    | 7.50                      | 8.25  | 9.00  | 9.75  | 10.50 | 11.25 | 12.00 |
| 10                                 | 2.50                      | 1.581                                    | 7.91                      | 8.70  | 9.49  | 10.28 | 11.07 | 11.86 | 12.65 |
| 11                                 | 2.75                      | 1.658                                    | 8.29                      | 9.12  | 9.95  | 10.78 | 11.61 | 12.44 | 13.26 |
| 12                                 | 3.00                      | 1.732                                    | 8.66                      | 9.53  | 10.39 | 11.26 | 12.12 | 12.99 | 13.86 |
| 13                                 | 3.25                      | 1.803                                    | 9.01                      | 9.92  | 10.82 | 11.72 | 12.62 | 13.52 | 14.42 |
| 14                                 | 3.50                      | 1.871                                    | 9.35                      | 10.29 | 11.22 | 12.16 | 13.10 | 14.03 | 14.97 |
| 15                                 | 3.75                      | 1.936                                    | 9.68                      | 10.65 | 11.62 | 12.59 | 13.55 | 14.52 | 15.49 |
| 16                                 | 4.00                      | 2.000                                    | 10.00                     | 11.00 | 12.00 | 13.00 | 14.00 | 15.00 | 16.00 |
| 17                                 | 4.25                      | 2.062                                    | 10.31                     | 11.34 | 12.37 | 13.40 | 14.43 | 15.47 | 16.50 |
| 18                                 | 4.50                      | 2.121                                    | 10.61                     | 11.67 | 12.73 | 13.79 | 14.85 | 15.91 | 16.97 |
| 19                                 | 4.75                      | 2.179                                    | 10.90                     | 11.98 | 13.07 | 14.16 | 15.25 | 16.34 | 17.43 |
| 20                                 | 5.00                      | 2.236                                    | 11.18                     | 12.30 | 13.42 | 14.53 | 15.65 | 16.77 | 17.89 |
| 21                                 | 5.25                      | 2.291                                    | 11.46                     | 12.60 | 13.75 | 14.89 | 16.04 | 17.18 | 18.33 |
| 22                                 | 5.50                      | 2.345                                    | 11.73                     | 12.90 | 14.07 | 15.24 | 16.42 | 17.59 | 18.76 |
| 23                                 | 5.75                      | 2.398                                    | 11.99                     | 13.19 | 14.39 | 15.59 | 16.79 | 17.99 | 19.18 |
| 24                                 | 6.00                      | 2.449                                    | 12.25                     | 13.48 | 14.70 | 15.93 | 17.15 | 18.37 | 19.59 |
| 25                                 | 6.25                      | 2.500                                    | 12.50                     | 13.75 | 15.00 | 16.25 | 17.50 | 18.75 | 20.00 |
| 26                                 | 6.50                      | 2.550                                    | 12.75                     | 14.03 | 15.30 | 16.58 | 17.85 | 19.13 | 20.40 |
| 27                                 | 6.75                      | 2.598                                    | 12.99                     | 14.29 | 15.59 | 16.89 | 18.19 | 19.49 | 20.78 |
| 28                                 | 7.00                      | 2.646                                    | 13.23                     | 14.55 | 15.87 | 17.20 | 18.52 | 19.85 | 21.17 |
| 29                                 | 7.25                      | 2.693                                    | 13.46                     | 14.81 | 16.16 | 17.50 | 18.85 | 20.20 | 21.54 |
| 30                                 | 7.50                      | 2.739                                    | 13.69                     | 15.06 | 16.43 | 17.80 | 19.17 | 20.54 | 21.91 |
| 31                                 | 7.75                      | 2.784                                    | 13.92                     | 15.31 | 16.70 | 18.10 | 19.49 | 20.88 | 22.27 |
| 32                                 | 8.00                      | 2.828                                    | 14.14                     | 15.55 | 16.97 | 18.38 | 19.80 | 21.21 | 22.62 |
| 33                                 | 8.25                      | 2.872                                    | 14.36                     | 15.80 | 17.23 | 18.67 | 20.10 | 21.54 | 22.98 |
| 34                                 | 8.50                      | 2.915                                    | 14.58                     | 16.04 | 17.49 | 18.95 | 20.41 | 21.87 | 23.32 |
| 35                                 | 8.75                      | 2.958                                    | 14.79                     | 16.27 | 17.75 | 19.23 | 20.71 | 22.19 | 23.66 |
| 36                                 | 9.00                      | 3.000                                    | 15.00                     | 16.50 | 18.00 | 19.50 | 21.00 | 22.50 | 24.00 |
| 37                                 | 9.25                      | 3.041                                    | 15.21                     | 16.73 | 18.25 | 19.77 | 21.29 | 22.81 | 24.33 |
| 38                                 | 9.50                      | 3.082                                    | 15.41                     | 16.95 | 18.49 | 20.03 | 21.57 | 23.12 | 24.66 |
| 39                                 | 9.75                      | 3.123                                    | 15.62                     | 17.18 | 18.74 | 20.30 | 21.86 | 23.42 | 24.98 |
| 40                                 | 10.00                     | 3.162                                    | 15.81                     | 17.39 | 18.97 | 20.55 | 22.13 | 23.72 | 25.30 |
| 41                                 | 10.25                     | 3.202                                    | 16.01                     | 17.61 | 19.21 | 20.81 | 22.41 | 24.02 | 25.62 |
| 42                                 | 10.50                     | 3.240                                    | 16.20                     | 17.82 | 19.44 | 21.06 | 22.68 | 24.30 | 25.92 |
| 43                                 | 10.75                     | 3.279                                    | 16.39                     | 18.03 | 19.67 | 21.31 | 22.95 | 24.59 | 26.23 |
| 44                                 | 11.00                     | 3.317                                    | 16.58                     | 18.24 | 19.90 | 21.56 | 23.22 | 24.88 | 26.54 |
| 45                                 | 11.25                     | 3.354                                    | 16.77                     | 18.45 | 20.12 | 21.80 | 23.48 | 25.16 | 26.83 |
| 46                                 | 11.50                     | 3.391                                    | 16.96                     | 18.65 | 20.35 | 22.04 | 23.74 | 25.43 | 27.13 |
| 47                                 | 11.75                     | 3.428                                    | 17.14                     | 18.85 | 20.57 | 22.28 | 24.00 | 25.71 | 27.42 |
| 48                                 | 12.00                     | 3.464                                    | 17.32                     | 19.05 | 20.78 | 22.52 | 24.25 | 25.98 | 27.71 |
| 49                                 | 12.25                     | 3.500                                    | 17.50                     | 19.25 | 21.00 | 22.75 | 24.50 | 26.25 | 28.00 |
| 50                                 | 12.50                     | 3.536                                    | 17.68                     | 19.45 | 21.22 | 22.98 | 24.75 | 26.52 | 28.29 |
| 51                                 | 12.75                     | 3.571                                    | 17.85                     | 19.64 | 21.42 | 23.21 | 25.00 | 26.78 | 28.57 |
| 52                                 | 13.00                     | 3.606                                    | 18.03                     | 19.83 | 21.63 | 23.44 | 25.24 | 27.05 | 28.85 |
| 53                                 | 13.25                     | 3.640                                    | 18.20                     | 20.02 | 21.84 | 23.66 | 25.48 | 27.30 | 29.12 |
| 54                                 | 13.50                     | 3.674                                    | 18.37                     | 20.21 | 22.05 | 23.88 | 25.72 | 27.56 | 29.39 |
| 55                                 | 13.75                     | 3.708                                    | 18.54                     | 20.39 | 22.25 | 24.10 | 25.96 | 27.81 | 29.66 |
| 56                                 | 14.00                     | 3.742                                    | 18.71                     | 20.58 | 22.45 | 24.32 | 26.19 | 28.07 | 29.94 |
| 57                                 | 14.25                     | 3.775                                    | 18.87                     | 20.76 | 22.65 | 24.54 | 26.43 | 28.31 | 30.20 |
| 58                                 | 14.50                     | 3.808                                    | 19.04                     | 20.94 | 22.85 | 24.75 | 26.66 | 28.56 | 30.46 |
| 59                                 | 14.75                     | 3.841                                    | 19.20                     | 21.13 | 23.05 | 24.97 | 26.89 | 28.81 | 30.73 |
| 60                                 | 15.00                     | 3.873                                    | 19.37                     | 21.30 | 23.24 | 25.17 | 27.11 | 29.05 | 30.98 |

**FOUR PLY TWIST TABLE**—(Continued)

| No. of<br>Yarn<br>to be<br>Twisted | No. of<br>Twisted<br>Yarn | Sq. Root<br>of No. of<br>Twisted<br>Yarn | TWIST PER INCH            |       |       |       |       |       |       |
|------------------------------------|---------------------------|--|---------------------------|-------|-------|-------|-------|-------|-------|
|                                    |                           |  | Square Root Multiplied by |       |       |       |       |       |       |
|                                    |                           |  | 4                         | 4½    | 5     | 5½    | 6     | 6½    | 7     |
| 61                                 | 15.25                     | 3.905                                    | 15.62                     | 17.57 | 19.53 | 21.48 | 23.43 | 25.38 | 27.34 |
| 62                                 | 15.50                     | 3.937                                    | 15.75                     | 17.72 | 19.69 | 21.65 | 23.62 | 25.59 | 27.56 |
| 63                                 | 15.75                     | 3.969                                    | 15.88                     | 17.86 | 19.85 | 21.83 | 23.81 | 25.80 | 27.78 |
| 64                                 | 16.00                     | 4.000                                    | 16.00                     | 18.00 | 20.00 | 22.00 | 24.00 | 26.00 | 28.00 |
| 65                                 | 16.25                     | 4.031                                    | 16.12                     | 18.14 | 20.16 | 22.17 | 24.19 | 26.20 | 28.22 |
| 66                                 | 16.50                     | 4.062                                    | 16.25                     | 18.28 | 20.31 | 22.34 | 24.37 | 26.40 | 28.43 |
| 67                                 | 16.75                     | 4.093                                    | 16.37                     | 18.42 | 20.46 | 22.51 | 24.56 | 26.60 | 28.65 |
| 68                                 | 17.00                     | 4.123                                    | 16.49                     | 18.55 | 20.62 | 22.68 | 24.74 | 26.80 | 28.86 |
| 69                                 | 17.25                     | 4.153                                    | 16.61                     | 18.69 | 20.77 | 22.84 | 24.92 | 26.99 | 29.07 |
| 70                                 | 17.50                     | 4.183                                    | 16.73                     | 18.82 | 20.92 | 23.01 | 25.10 | 27.19 | 29.28 |
| 71                                 | 17.75                     | 4.213                                    | 16.85                     | 18.96 | 21.07 | 23.17 | 25.28 | 27.38 | 29.49 |
| 72                                 | 18.00                     | 4.243                                    | 16.97                     | 19.09 | 21.21 | 23.34 | 25.46 | 27.58 | 29.70 |
| 73                                 | 18.25                     | 4.272                                    | 17.09                     | 19.22 | 21.36 | 23.50 | 25.63 | 27.77 | 29.90 |
| 74                                 | 18.50                     | 4.301                                    | 17.20                     | 19.35 | 21.51 | 23.66 | 25.81 | 27.96 | 30.11 |
| 75                                 | 18.75                     | 4.330                                    | 17.32                     | 19.49 | 21.65 | 23.82 | 25.98 | 28.15 | 30.31 |
| 76                                 | 19.00                     | 4.359                                    | 17.44                     | 19.62 | 21.79 | 23.97 | 26.15 | 28.33 | 30.51 |
| 77                                 | 19.25                     | 4.388                                    | 17.55                     | 19.75 | 21.94 | 24.13 | 26.33 | 28.52 | 30.72 |
| 78                                 | 19.50                     | 4.416                                    | 17.66                     | 19.87 | 22.08 | 24.29 | 26.50 | 28.70 | 30.91 |
| 79                                 | 19.75                     | 4.444                                    | 17.78                     | 20.00 | 22.22 | 24.44 | 26.66 | 28.89 | 31.11 |
| 80                                 | 20.00                     | 4.472                                    | 17.89                     | 20.12 | 22.36 | 24.60 | 26.83 | 29.07 | 31.30 |
| 81                                 | 20.25                     | 4.500                                    | 18.00                     | 20.25 | 22.50 | 24.75 | 27.00 | 29.25 | 31.50 |
| 82                                 | 20.50                     | 4.528                                    | 18.11                     | 20.38 | 22.64 | 24.90 | 27.17 | 29.43 | 31.70 |
| 83                                 | 20.75                     | 4.555                                    | 18.22                     | 20.50 | 22.78 | 25.05 | 27.33 | 29.61 | 31.89 |
| 84                                 | 21.00                     | 4.583                                    | 18.33                     | 20.62 | 22.92 | 25.21 | 27.50 | 29.79 | 32.08 |
| 85                                 | 21.25                     | 4.610                                    | 18.44                     | 20.75 | 23.05 | 25.36 | 27.66 | 29.97 | 32.27 |
| 86                                 | 21.50                     | 4.637                                    | 18.55                     | 20.87 | 23.19 | 25.50 | 27.82 | 30.14 | 32.46 |
| 87                                 | 21.75                     | 4.664                                    | 18.66                     | 20.99 | 23.32 | 25.65 | 27.98 | 30.32 | 32.65 |
| 88                                 | 22.00                     | 4.690                                    | 18.76                     | 21.11 | 23.45 | 25.80 | 28.14 | 30.49 | 32.83 |
| 89                                 | 22.25                     | 4.717                                    | 18.87                     | 21.23 | 23.59 | 25.94 | 28.30 | 30.66 | 33.02 |
| 90                                 | 22.50                     | 4.743                                    | 18.97                     | 21.34 | 23.72 | 26.09 | 28.46 | 30.83 | 33.20 |
| 91                                 | 22.75                     | 4.770                                    | 19.08                     | 21.47 | 23.85 | 26.24 | 28.62 | 31.00 | 33.39 |
| 92                                 | 23.00                     | 4.796                                    | 19.18                     | 21.58 | 23.98 | 26.38 | 28.78 | 31.17 | 33.57 |
| 93                                 | 23.25                     | 4.822                                    | 19.29                     | 21.70 | 24.11 | 26.52 | 28.93 | 31.34 | 33.75 |
| 94                                 | 23.50                     | 4.848                                    | 19.39                     | 21.82 | 24.24 | 26.66 | 29.09 | 31.51 | 33.94 |
| 95                                 | 23.75                     | 4.873                                    | 19.49                     | 21.93 | 24.37 | 26.80 | 29.24 | 31.67 | 34.11 |
| 96                                 | 24.00                     | 4.899                                    | 19.60                     | 22.05 | 24.49 | 26.94 | 29.39 | 31.84 | 34.29 |
| 97                                 | 24.25                     | 4.924                                    | 19.70                     | 22.16 | 24.62 | 27.08 | 29.55 | 32.01 | 34.47 |
| 98                                 | 24.50                     | 4.950                                    | 19.80                     | 22.28 | 24.75 | 27.23 | 29.70 | 32.18 | 34.65 |
| 99                                 | 24.75                     | 4.975                                    | 19.90                     | 22.39 | 24.87 | 27.36 | 29.85 | 32.34 | 34.83 |
| 100                                | 25.00                     | 5.000                                    | 20.00                     | 22.50 | 25.00 | 27.50 | 30.00 | 32.50 | 35.00 |
| 101                                | 25.25                     | 5.025                                    | 20.10                     | 22.61 | 25.12 | 27.64 | 30.15 | 32.66 | 35.18 |
| 102                                | 25.50                     | 5.050                                    | 20.20                     | 22.73 | 25.25 | 27.78 | 30.30 | 32.83 | 35.35 |
| 103                                | 25.75                     | 5.074                                    | 20.30                     | 22.83 | 25.37 | 27.91 | 30.45 | 32.98 | 35.52 |
| 104                                | 26.00                     | 5.099                                    | 20.40                     | 22.95 | 25.50 | 28.04 | 30.59 | 33.14 | 35.69 |
| 105                                | 26.25                     | 5.124                                    | 20.50                     | 23.06 | 25.62 | 28.18 | 30.74 | 33.31 | 35.87 |
| 106                                | 26.50                     | 5.148                                    | 20.59                     | 23.17 | 25.74 | 28.31 | 30.89 | 33.46 | 36.04 |
| 107                                | 26.75                     | 5.172                                    | 20.69                     | 23.27 | 25.86 | 28.45 | 31.03 | 33.62 | 36.20 |
| 108                                | 27.00                     | 5.196                                    | 20.78                     | 23.38 | 25.98 | 28.58 | 31.18 | 33.77 | 36.37 |
| 109                                | 27.25                     | 5.220                                    | 20.88                     | 23.49 | 26.10 | 28.71 | 31.32 | 33.93 | 36.54 |
| 110                                | 27.50                     | 5.244                                    | 20.98                     | 23.60 | 26.22 | 28.84 | 31.46 | 34.09 | 36.71 |
| 111                                | 27.75                     | 5.268                                    | 21.07                     | 23.71 | 26.34 | 28.97 | 31.61 | 34.24 | 36.88 |
| 112                                | 28.00                     | 5.292                                    | 21.17                     | 23.81 | 26.46 | 29.11 | 31.75 | 34.40 | 37.04 |
| 113                                | 28.25                     | 5.315                                    | 21.26                     | 23.92 | 26.58 | 29.23 | 31.89 | 34.55 | 37.20 |
| 114                                | 28.50                     | 5.339                                    | 21.36                     | 24.03 | 26.69 | 29.36 | 32.03 | 34.70 | 37.37 |
| 115                                | 28.75                     | 5.362                                    | 21.45                     | 24.13 | 26.81 | 29.49 | 32.17 | 34.85 | 37.53 |
| 116                                | 29.00                     | 5.385                                    | 21.54                     | 24.23 | 26.93 | 29.62 | 32.31 | 35.00 | 37.70 |
| 117                                | 29.25                     | 5.408                                    | 21.63                     | 24.34 | 27.04 | 29.74 | 32.45 | 35.15 | 37.86 |
| 118                                | 29.50                     | 5.431                                    | 21.72                     | 24.44 | 27.16 | 29.87 | 32.59 | 35.30 | 38.02 |
| 119                                | 29.75                     | 5.454                                    | 21.82                     | 24.54 | 27.27 | 30.00 | 32.73 | 35.45 | 38.18 |
| 120                                | 30.00                     | 5.477                                    | 21.91                     | 24.65 | 27.39 | 30.12 | 32.86 | 35.60 | 38.34 |



# FOUR PLY TWIST TABLE—(Continued)

| No. of<br>Yarn<br>to be<br>Twisted | No. of<br>Twisted<br>Yarn | Sq. Root<br>of No. of<br>Twisted<br>Yarn | TWIST PER INCH            |       |       |       |       |       |       |
|------------------------------------|---------------------------|--|---------------------------|-------|-------|-------|-------|-------|-------|
|                                    |                           |  | Square Root Multiplied by |       |       |       |       |       |       |
|                                    |                           |  | 4                         | 4½    | 5     | 5½    | 6     | 6½    | 7     |
| 121                                | 30.25                     | 5.500                                    | 22.00                     | 24.75 | 27.50 | 30.25 | 33.00 | 35.75 | 38.50 |
| 122                                | 30.50                     | 5.523                                    | 22.09                     | 24.85 | 27.61 | 30.38 | 33.14 | 35.90 | 38.66 |
| 123                                | 30.75                     | 5.545                                    | 22.18                     | 24.95 | 27.73 | 30.50 | 33.27 | 36.04 | 38.82 |
| 124                                | 31.00                     | 5.568                                    | 22.27                     | 25.06 | 27.84 | 30.62 | 33.41 | 36.19 | 38.98 |
| 125                                | 31.25                     | 5.590                                    | 22.36                     | 25.16 | 27.95 | 30.75 | 33.54 | 36.34 | 39.13 |
| 126                                | 31.50                     | 5.613                                    | 22.45                     | 25.26 | 28.06 | 30.87 | 33.68 | 36.48 | 39.29 |
| 127                                | 31.75                     | 5.635                                    | 22.54                     | 25.36 | 28.17 | 30.99 | 33.81 | 36.63 | 39.45 |
| 128                                | 32.00                     | 5.657                                    | 22.63                     | 25.46 | 28.28 | 31.11 | 33.94 | 36.77 | 39.60 |
| 129                                | 32.25                     | 5.679                                    | 22.72                     | 25.56 | 28.39 | 31.23 | 34.07 | 36.91 | 39.75 |
| 130                                | 32.50                     | 5.701                                    | 22.80                     | 25.65 | 28.50 | 31.36 | 34.21 | 37.06 | 39.91 |
| 131                                | 32.75                     | 5.723                                    | 22.89                     | 25.75 | 28.61 | 31.48 | 34.34 | 37.20 | 40.06 |
| 132                                | 33.00                     | 5.745                                    | 22.98                     | 25.85 | 28.72 | 31.60 | 34.47 | 37.34 | 40.22 |
| 133                                | 33.25                     | 5.766                                    | 23.06                     | 25.95 | 28.83 | 31.71 | 34.60 | 37.48 | 40.36 |
| 134                                | 33.50                     | 5.788                                    | 23.15                     | 26.05 | 28.94 | 31.83 | 34.73 | 37.62 | 40.52 |
| 135                                | 33.75                     | 5.810                                    | 23.24                     | 26.15 | 29.05 | 31.96 | 34.86 | 37.77 | 40.67 |
| 136                                | 34.00                     | 5.831                                    | 23.32                     | 26.24 | 29.15 | 32.07 | 34.99 | 37.90 | 40.82 |
| 137                                | 34.25                     | 5.852                                    | 23.41                     | 26.33 | 29.26 | 32.19 | 35.11 | 38.04 | 40.96 |
| 138                                | 34.50                     | 5.874                                    | 23.50                     | 26.43 | 29.37 | 32.31 | 35.24 | 38.18 | 41.12 |
| 139                                | 34.75                     | 5.895                                    | 23.58                     | 26.53 | 29.47 | 32.42 | 35.37 | 38.32 | 41.27 |
| 140                                | 35.00                     | 5.916                                    | 23.66                     | 26.62 | 29.58 | 32.54 | 35.50 | 38.45 | 41.41 |
| 141                                | 35.25                     | 5.937                                    | 23.75                     | 26.72 | 29.69 | 32.65 | 35.62 | 38.59 | 41.56 |
| 142                                | 35.50                     | 5.958                                    | 23.83                     | 26.81 | 29.79 | 32.77 | 35.75 | 38.73 | 41.71 |
| 143                                | 35.75                     | 5.979                                    | 23.92                     | 26.91 | 29.90 | 32.88 | 35.87 | 38.86 | 41.85 |
| 144                                | 36.00                     | 6.000                                    | 24.00                     | 27.00 | 30.00 | 33.00 | 36.00 | 39.00 | 42.00 |
| 145                                | 36.25                     | 6.021                                    | 24.08                     | 27.09 | 30.10 | 33.12 | 36.13 | 39.14 | 42.15 |
| 146                                | 36.50                     | 6.042                                    | 24.17                     | 27.19 | 30.21 | 33.23 | 36.25 | 39.27 | 42.29 |
| 147                                | 36.75                     | 6.062                                    | 24.25                     | 27.28 | 30.31 | 33.34 | 36.37 | 39.40 | 42.43 |
| 148                                | 37.00                     | 6.083                                    | 24.33                     | 27.37 | 30.41 | 33.46 | 36.50 | 39.54 | 42.58 |
| 149                                | 37.25                     | 6.103                                    | 24.41                     | 27.46 | 30.52 | 33.57 | 36.62 | 39.67 | 42.72 |
| 150                                | 37.50                     | 6.124                                    | 24.50                     | 27.56 | 30.62 | 33.68 | 36.74 | 39.81 | 42.87 |
| 151                                | 37.75                     | 6.144                                    | 24.58                     | 27.65 | 30.72 | 33.79 | 36.86 | 39.94 | 43.01 |
| 152                                | 38.00                     | 6.164                                    | 24.66                     | 27.74 | 30.82 | 33.90 | 36.98 | 40.07 | 43.15 |
| 153                                | 38.25                     | 6.185                                    | 24.74                     | 27.83 | 30.93 | 34.02 | 37.11 | 40.20 | 43.30 |
| 154                                | 38.50                     | 6.205                                    | 24.82                     | 27.92 | 31.03 | 34.13 | 37.23 | 40.33 | 43.44 |
| 155                                | 38.75                     | 6.225                                    | 24.90                     | 28.01 | 31.13 | 34.24 | 37.35 | 40.46 | 43.58 |
| 156                                | 39.00                     | 6.245                                    | 24.98                     | 28.10 | 31.23 | 34.35 | 37.47 | 40.59 | 43.72 |
| 157                                | 39.25                     | 6.265                                    | 25.06                     | 28.19 | 31.33 | 34.46 | 37.59 | 40.72 | 43.86 |
| 158                                | 39.50                     | 6.285                                    | 25.14                     | 28.28 | 31.43 | 34.57 | 37.71 | 40.85 | 44.00 |
| 159                                | 39.75                     | 6.305                                    | 25.22                     | 28.37 | 31.53 | 34.68 | 37.83 | 40.98 | 44.14 |
| 160                                | 40.00                     | 6.325                                    | 25.30                     | 28.46 | 31.63 | 34.79 | 37.95 | 41.11 | 44.28 |
| 161                                | 40.25                     | 6.344                                    | 25.38                     | 28.55 | 31.72 | 34.89 | 38.06 | 41.24 | 44.41 |
| 162                                | 40.50                     | 6.364                                    | 25.46                     | 28.64 | 31.82 | 35.00 | 38.18 | 41.37 | 44.55 |
| 163                                | 40.75                     | 6.384                                    | 25.54                     | 28.73 | 31.92 | 35.11 | 38.30 | 41.50 | 44.69 |
| 164                                | 41.00                     | 6.403                                    | 25.61                     | 28.81 | 32.02 | 35.22 | 38.42 | 41.62 | 44.82 |
| 165                                | 41.25                     | 6.423                                    | 25.69                     | 28.90 | 32.12 | 35.33 | 38.54 | 41.75 | 44.96 |
| 166                                | 41.50                     | 6.442                                    | 25.77                     | 28.99 | 32.21 | 35.43 | 38.65 | 41.87 | 45.09 |
| 167                                | 41.75                     | 6.461                                    | 25.84                     | 29.07 | 32.31 | 35.54 | 38.77 | 42.00 | 45.23 |
| 168                                | 42.00                     | 6.481                                    | 25.92                     | 29.16 | 32.41 | 35.65 | 38.89 | 42.13 | 45.37 |
| 169                                | 42.25                     | 6.500                                    | 26.00                     | 29.25 | 32.50 | 35.75 | 39.00 | 42.25 | 45.50 |
| 170                                | 42.50                     | 6.519                                    | 26.08                     | 29.34 | 32.60 | 35.85 | 39.11 | 42.37 | 45.63 |
| 171                                | 42.75                     | 6.538                                    | 26.15                     | 29.42 | 32.69 | 35.96 | 39.23 | 42.50 | 45.77 |
| 172                                | 43.00                     | 6.557                                    | 26.23                     | 29.51 | 32.79 | 36.06 | 39.34 | 42.62 | 45.90 |
| 173                                | 43.25                     | 6.576                                    | 26.30                     | 29.59 | 32.88 | 36.17 | 39.46 | 42.74 | 46.03 |
| 174                                | 43.50                     | 6.595                                    | 26.38                     | 29.68 | 32.98 | 36.27 | 39.57 | 42.87 | 46.17 |
| 175                                | 43.75                     | 6.614                                    | 26.46                     | 29.76 | 33.07 | 36.38 | 39.68 | 42.99 | 46.30 |
| 176                                | 44.00                     | 6.633                                    | 26.53                     | 29.85 | 33.17 | 36.48 | 39.80 | 43.11 | 46.43 |
| 177                                | 44.25                     | 6.652                                    | 26.61                     | 29.93 | 33.26 | 36.59 | 39.91 | 43.24 | 46.56 |
| 178                                | 44.50                     | 6.671                                    | 26.68                     | 30.02 | 33.36 | 36.69 | 40.03 | 43.36 | 46.70 |
| 179                                | 44.75                     | 6.690                                    | 26.76                     | 30.11 | 33.45 | 36.80 | 40.14 | 43.49 | 46.83 |
| 180                                | 45.00                     | 6.708                                    | 26.83                     | 30.19 | 33.54 | 36.89 | 40.25 | 43.60 | 46.96 |

# FIVE PLY TWIST TABLE

| No. of<br>Yarn<br>to be<br>Twisted | No. of<br>Twisted<br>Yarn | Sq. Root<br>of No. of<br>Twisted<br>Yarn | TWIST PER INCH            |      |      |       |       |       |       |
|------------------------------------|---------------------------|--|---------------------------|------|------|-------|-------|-------|-------|
|                                    |                           |  | Square Root Multiplied by |      |      |       |       |       |       |
|                                    |                           |  | 1½                        | 2    | 2½   | 3     | 3½    | 4     | 4½    |
| 1                                  | .2                        | .447                                     | .67                       | .89  | 1.11 | 1.34  | 1.56  | 1.79  | 2.01  |
| 2                                  | .4                        | .632                                     | .95                       | 1.26 | 1.58 | 1.90  | 2.22  | 2.53  | 2.85  |
| 3                                  | .6                        | .775                                     | 1.16                      | 1.55 | 1.94 | 2.33  | 2.71  | 3.10  | 3.49  |
| 4                                  | .8                        | .894                                     | 1.34                      | 1.79 | 2.24 | 2.68  | 3.13  | 3.58  | 4.02  |
| 5                                  | 1.0                       | 1.000                                    | 1.50                      | 2.00 | 2.50 | 3.00  | 3.50  | 4.00  | 4.50  |
| 6                                  | 1.2                       | 1.095                                    | 1.64                      | 2.19 | 2.74 | 3.29  | 3.83  | 4.38  | 4.93  |
| 7                                  | 1.4                       | 1.183                                    | 1.77                      | 2.37 | 2.96 | 3.55  | 4.14  | 4.73  | 5.32  |
| 8                                  | 1.6                       | 1.265                                    | 1.90                      | 2.53 | 3.16 | 3.80  | 4.43  | 5.06  | 5.69  |
| 9                                  | 1.8                       | 1.342                                    | 2.01                      | 2.68 | 3.36 | 4.03  | 4.70  | 5.37  | 6.04  |
| 10                                 | 2.0                       | 1.414                                    | 2.12                      | 2.83 | 3.54 | 4.24  | 4.95  | 5.66  | 6.36  |
| 11                                 | 2.2                       | 1.483                                    | 2.22                      | 2.97 | 3.71 | 4.45  | 5.19  | 5.93  | 6.67  |
| 12                                 | 2.4                       | 1.549                                    | 2.32                      | 3.10 | 3.87 | 4.65  | 5.42  | 6.20  | 6.97  |
| 13                                 | 2.6                       | 1.612                                    | 2.42                      | 3.22 | 4.03 | 4.84  | 5.65  | 6.45  | 7.26  |
| 14                                 | 2.8                       | 1.673                                    | 2.51                      | 3.35 | 4.18 | 5.02  | 5.86  | 6.69  | 7.53  |
| 15                                 | 3.0                       | 1.732                                    | 2.60                      | 3.46 | 4.33 | 5.20  | 6.06  | 6.93  | 7.79  |
| 16                                 | 3.2                       | 1.789                                    | 2.68                      | 3.58 | 4.47 | 5.37  | 6.26  | 7.16  | 8.05  |
| 17                                 | 3.4                       | 1.844                                    | 2.77                      | 3.69 | 4.61 | 5.53  | 6.45  | 7.38  | 8.30  |
| 18                                 | 3.6                       | 1.897                                    | 2.85                      | 3.79 | 4.74 | 5.69  | 6.64  | 7.59  | 8.54  |
| 19                                 | 3.8                       | 1.949                                    | 2.92                      | 3.90 | 4.87 | 5.85  | 6.82  | 7.80  | 8.77  |
| 20                                 | 4.0                       | 2.000                                    | 3.00                      | 4.00 | 5.00 | 6.00  | 7.00  | 8.00  | 9.00  |
| 21                                 | 4.2                       | 2.049                                    | 3.07                      | 4.10 | 5.12 | 6.15  | 7.17  | 8.20  | 9.22  |
| 22                                 | 4.4                       | 2.098                                    | 3.15                      | 4.20 | 5.25 | 6.29  | 7.34  | 8.39  | 9.44  |
| 23                                 | 4.6                       | 2.145                                    | 3.22                      | 4.29 | 5.36 | 6.44  | 7.51  | 8.58  | 9.65  |
| 24                                 | 4.8                       | 2.191                                    | 3.29                      | 4.38 | 5.48 | 6.57  | 7.67  | 8.76  | 9.86  |
| 25                                 | 5.0                       | 2.236                                    | 3.35                      | 4.47 | 5.59 | 6.71  | 7.83  | 8.94  | 10.06 |
| 26                                 | 5.2                       | 2.280                                    | 3.42                      | 4.56 | 5.70 | 6.84  | 7.98  | 9.12  | 10.26 |
| 27                                 | 5.4                       | 2.324                                    | 3.49                      | 4.65 | 5.81 | 6.97  | 8.13  | 9.30  | 10.46 |
| 28                                 | 5.6                       | 2.366                                    | 3.55                      | 4.73 | 5.92 | 7.10  | 8.28  | 9.47  | 10.65 |
| 29                                 | 5.8                       | 2.408                                    | 3.61                      | 4.82 | 6.02 | 7.22  | 8.43  | 9.63  | 10.84 |
| 30                                 | 6.0                       | 2.449                                    | 3.67                      | 4.90 | 6.12 | 7.35  | 8.57  | 9.80  | 11.02 |
| 31                                 | 6.2                       | 2.490                                    | 3.74                      | 4.98 | 6.23 | 7.47  | 8.72  | 9.96  | 11.21 |
| 32                                 | 6.4                       | 2.530                                    | 3.80                      | 5.06 | 6.33 | 7.59  | 8.86  | 10.12 | 11.39 |
| 33                                 | 6.6                       | 2.569                                    | 3.85                      | 5.14 | 6.42 | 7.71  | 8.99  | 10.28 | 11.56 |
| 34                                 | 6.8                       | 2.608                                    | 3.91                      | 5.22 | 6.52 | 7.82  | 9.13  | 10.43 | 11.74 |
| 35                                 | 7.0                       | 2.646                                    | 3.97                      | 5.29 | 6.62 | 7.94  | 9.26  | 10.58 | 11.91 |
| 36                                 | 7.2                       | 2.683                                    | 4.02                      | 5.37 | 6.71 | 8.05  | 9.39  | 10.73 | 12.07 |
| 37                                 | 7.4                       | 2.720                                    | 4.08                      | 5.44 | 6.80 | 8.16  | 9.52  | 10.88 | 12.24 |
| 38                                 | 7.6                       | 2.757                                    | 4.14                      | 5.51 | 6.89 | 8.27  | 9.65  | 11.03 | 12.41 |
| 39                                 | 7.8                       | 2.793                                    | 4.19                      | 5.59 | 6.98 | 8.38  | 9.78  | 11.17 | 12.57 |
| 40                                 | 8.0                       | 2.828                                    | 4.24                      | 5.66 | 7.07 | 8.48  | 9.90  | 11.31 | 12.73 |
| 41                                 | 8.2                       | 2.864                                    | 4.30                      | 5.73 | 7.16 | 8.59  | 10.02 | 11.46 | 12.89 |
| 42                                 | 8.4                       | 2.898                                    | 4.35                      | 5.80 | 7.25 | 8.69  | 10.14 | 11.59 | 13.04 |
| 43                                 | 8.6                       | 2.933                                    | 4.40                      | 5.87 | 7.33 | 8.80  | 10.27 | 11.73 | 13.20 |
| 44                                 | 8.8                       | 2.966                                    | 4.45                      | 5.93 | 7.42 | 8.90  | 10.38 | 11.86 | 13.35 |
| 45                                 | 9.0                       | 3.000                                    | 4.50                      | 6.00 | 7.50 | 9.00  | 10.50 | 12.00 | 13.50 |
| 46                                 | 9.2                       | 3.033                                    | 4.55                      | 6.07 | 7.58 | 9.10  | 10.62 | 12.13 | 13.65 |
| 47                                 | 9.4                       | 3.066                                    | 4.60                      | 6.13 | 7.67 | 9.20  | 10.73 | 12.26 | 13.80 |
| 48                                 | 9.6                       | 3.098                                    | 4.65                      | 6.20 | 7.75 | 9.29  | 10.84 | 12.39 | 13.94 |
| 49                                 | 9.8                       | 3.130                                    | 4.70                      | 6.26 | 7.83 | 9.39  | 10.96 | 12.52 | 14.09 |
| 50                                 | 10.0                      | 3.162                                    | 4.74                      | 6.32 | 7.91 | 9.49  | 11.07 | 12.65 | 14.23 |
| 51                                 | 10.2                      | 3.194                                    | 4.79                      | 6.39 | 7.99 | 9.58  | 11.18 | 12.78 | 14.38 |
| 52                                 | 10.4                      | 3.225                                    | 4.84                      | 6.45 | 8.06 | 9.68  | 11.29 | 12.90 | 14.51 |
| 53                                 | 10.6                      | 3.256                                    | 4.88                      | 6.51 | 8.14 | 9.77  | 11.40 | 13.02 | 14.65 |
| 54                                 | 10.8                      | 3.286                                    | 4.93                      | 6.57 | 8.22 | 9.86  | 11.50 | 13.15 | 14.79 |
| 55                                 | 11.0                      | 3.317                                    | 4.98                      | 6.63 | 8.29 | 9.95  | 11.61 | 13.27 | 14.93 |
| 56                                 | 11.2                      | 3.347                                    | 5.02                      | 6.69 | 8.37 | 10.04 | 11.71 | 13.39 | 15.06 |
| 57                                 | 11.4                      | 3.376                                    | 5.06                      | 6.75 | 8.44 | 10.13 | 11.82 | 13.51 | 15.19 |
| 58                                 | 11.6                      | 3.406                                    | 5.11                      | 6.81 | 8.52 | 10.22 | 11.92 | 13.62 | 15.33 |
| 59                                 | 11.8                      | 3.435                                    | 5.15                      | 6.87 | 8.59 | 10.31 | 12.02 | 13.74 | 15.46 |
| 60                                 | 12.0                      | 3.464                                    | 5.20                      | 6.93 | 8.66 | 10.39 | 12.12 | 13.86 | 15.59 |



# FIVE PLY TWIST TABLE — (Continued)

| No. of<br>Yarn<br>to be<br>Twisted | No. of<br>Twisted<br>Yarn | Sq. Root<br>of No. of<br>Twisted<br>Yarn | TWIST PER INCH            |       |       |       |       |       |       |
|------------------------------------|---------------------------|--|---------------------------|-------|-------|-------|-------|-------|-------|
|                                    |                           |  | Square Root Multiplied by |       |       |       |       |       |       |
|                                    |                           |  | 5                         | 5½    | 6     | 6½    | 7     | 7½    | 8     |
| 1                                  | .2                        | .447                                     | 2.24                      | 2.46  | 2.68  | 2.91  | 3.13  | 3.35  | 3.58  |
| 2                                  | .4                        | .632                                     | 3.16                      | 3.48  | 3.79  | 4.11  | 4.42  | 4.74  | 5.06  |
| 3                                  | .6                        | .775                                     | 3.88                      | 4.26  | 4.65  | 5.04  | 5.43  | 5.81  | 6.20  |
| 4                                  | .8                        | .894                                     | 4.47                      | 4.92  | 5.36  | 5.81  | 6.26  | 6.71  | 7.15  |
| 5                                  | 1.0                       | 1.000                                    | 5.00                      | 5.50  | 6.00  | 6.50  | 7.00  | 7.50  | 8.00  |
| 6                                  | 1.2                       | 1.095                                    | 5.48                      | 6.02  | 6.57  | 7.12  | 7.67  | 8.21  | 8.76  |
| 7                                  | 1.4                       | 1.183                                    | 5.92                      | 6.51  | 7.10  | 7.69  | 8.28  | 8.87  | 9.46  |
| 8                                  | 1.6                       | 1.265                                    | 6.32                      | 6.96  | 7.59  | 8.22  | 8.86  | 9.49  | 10.12 |
| 9                                  | 1.8                       | 1.342                                    | 6.71                      | 7.38  | 8.05  | 8.72  | 9.39  | 10.07 | 10.74 |
| 10                                 | 2.0                       | 1.414                                    | 7.07                      | 7.78  | 8.48  | 9.19  | 9.90  | 10.61 | 11.31 |
| 11                                 | 2.2                       | 1.483                                    | 7.42                      | 8.16  | 8.90  | 9.64  | 10.38 | 11.12 | 11.86 |
| 12                                 | 2.4                       | 1.549                                    | 7.75                      | 8.52  | 9.29  | 10.07 | 10.84 | 11.62 | 12.39 |
| 13                                 | 2.6                       | 1.612                                    | 8.06                      | 8.87  | 9.67  | 10.48 | 11.28 | 12.09 | 12.90 |
| 14                                 | 2.8                       | 1.673                                    | 8.37                      | 9.20  | 10.04 | 10.87 | 11.71 | 12.55 | 13.38 |
| 15                                 | 3.0                       | 1.732                                    | 8.66                      | 9.53  | 10.39 | 11.26 | 12.12 | 12.99 | 13.86 |
| 16                                 | 3.2                       | 1.789                                    | 8.95                      | 9.84  | 10.73 | 11.63 | 12.52 | 13.42 | 14.31 |
| 17                                 | 3.4                       | 1.844                                    | 9.22                      | 10.14 | 11.06 | 11.99 | 12.91 | 13.83 | 14.75 |
| 18                                 | 3.6                       | 1.897                                    | 9.49                      | 10.43 | 11.38 | 12.33 | 13.28 | 14.23 | 15.18 |
| 19                                 | 3.8                       | 1.949                                    | 9.75                      | 10.72 | 11.69 | 12.67 | 13.64 | 14.62 | 15.59 |
| 20                                 | 4.0                       | 2.000                                    | 10.00                     | 11.00 | 12.00 | 13.00 | 14.00 | 15.00 | 16.00 |
| 21                                 | 4.2                       | 2.049                                    | 10.25                     | 11.27 | 12.29 | 13.32 | 14.34 | 15.37 | 16.39 |
| 22                                 | 4.4                       | 2.098                                    | 10.49                     | 11.54 | 12.59 | 13.64 | 14.69 | 15.74 | 16.78 |
| 23                                 | 4.6                       | 2.145                                    | 10.73                     | 11.80 | 12.87 | 13.94 | 15.02 | 16.09 | 17.16 |
| 24                                 | 4.8                       | 2.191                                    | 10.96                     | 12.05 | 13.15 | 14.24 | 15.34 | 16.43 | 17.53 |
| 25                                 | 5.0                       | 2.236                                    | 11.18                     | 12.30 | 13.42 | 14.53 | 15.65 | 16.77 | 17.89 |
| 26                                 | 5.2                       | 2.280                                    | 11.40                     | 12.54 | 13.68 | 14.82 | 15.96 | 17.10 | 18.24 |
| 27                                 | 5.4                       | 2.324                                    | 11.62                     | 12.78 | 13.94 | 15.11 | 16.27 | 17.43 | 18.59 |
| 28                                 | 5.6                       | 2.366                                    | 11.83                     | 13.01 | 14.20 | 15.38 | 16.56 | 17.75 | 18.93 |
| 29                                 | 5.8                       | 2.408                                    | 12.04                     | 13.24 | 14.45 | 15.65 | 16.86 | 18.06 | 19.26 |
| 30                                 | 6.0                       | 2.449                                    | 12.25                     | 13.47 | 14.69 | 15.92 | 17.14 | 18.37 | 19.59 |
| 31                                 | 6.2                       | 2.490                                    | 12.45                     | 13.70 | 14.94 | 16.19 | 17.43 | 18.68 | 19.92 |
| 32                                 | 6.4                       | 2.530                                    | 12.65                     | 13.92 | 15.18 | 16.45 | 17.71 | 18.98 | 20.24 |
| 33                                 | 6.6                       | 2.569                                    | 12.85                     | 14.13 | 15.41 | 16.70 | 17.98 | 19.27 | 20.55 |
| 34                                 | 6.8                       | 2.608                                    | 13.04                     | 14.34 | 15.65 | 16.95 | 18.26 | 19.56 | 20.86 |
| 35                                 | 7.0                       | 2.646                                    | 13.23                     | 14.55 | 15.87 | 17.20 | 18.52 | 19.85 | 21.17 |
| 36                                 | 7.2                       | 2.683                                    | 13.42                     | 14.76 | 16.10 | 17.44 | 18.78 | 20.12 | 21.46 |
| 37                                 | 7.4                       | 2.720                                    | 13.60                     | 14.96 | 16.32 | 17.68 | 19.04 | 20.40 | 21.76 |
| 38                                 | 7.6                       | 2.757                                    | 13.78                     | 15.16 | 16.54 | 17.92 | 19.30 | 20.68 | 22.06 |
| 39                                 | 7.8                       | 2.793                                    | 13.96                     | 15.36 | 16.76 | 18.16 | 19.55 | 20.95 | 22.34 |
| 40                                 | 8.0                       | 2.828                                    | 14.14                     | 15.55 | 16.97 | 18.38 | 19.80 | 21.21 | 22.62 |
| 41                                 | 8.2                       | 2.864                                    | 14.32                     | 15.75 | 17.18 | 18.62 | 20.05 | 21.48 | 22.91 |
| 42                                 | 8.4                       | 2.898                                    | 14.49                     | 15.94 | 17.39 | 18.84 | 20.29 | 21.74 | 23.18 |
| 43                                 | 8.6                       | 2.933                                    | 14.66                     | 16.13 | 17.60 | 19.06 | 20.53 | 22.00 | 23.46 |
| 44                                 | 8.8                       | 2.966                                    | 14.83                     | 16.32 | 17.80 | 19.28 | 20.76 | 22.25 | 23.73 |
| 45                                 | 9.0                       | 3.000                                    | 15.00                     | 16.50 | 18.00 | 19.50 | 21.00 | 22.50 | 24.00 |
| 46                                 | 9.2                       | 3.033                                    | 15.17                     | 16.68 | 18.20 | 19.71 | 21.23 | 22.75 | 24.26 |
| 47                                 | 9.4                       | 3.066                                    | 15.33                     | 16.86 | 18.40 | 19.93 | 21.46 | 23.00 | 24.53 |
| 48                                 | 9.6                       | 3.098                                    | 15.49                     | 17.04 | 18.59 | 20.14 | 21.69 | 23.24 | 24.78 |
| 49                                 | 9.8                       | 3.130                                    | 15.65                     | 17.22 | 18.78 | 20.35 | 21.91 | 23.48 | 25.04 |
| 50                                 | 10.0                      | 3.162                                    | 15.81                     | 17.39 | 18.97 | 20.55 | 22.13 | 23.72 | 25.30 |
| 51                                 | 10.2                      | 3.194                                    | 15.97                     | 17.57 | 19.16 | 20.76 | 22.36 | 23.96 | 25.55 |
| 52                                 | 10.4                      | 3.225                                    | 16.12                     | 17.74 | 19.35 | 20.96 | 22.58 | 24.19 | 25.80 |
| 53                                 | 10.6                      | 3.256                                    | 16.28                     | 17.91 | 19.54 | 21.16 | 22.79 | 24.42 | 26.05 |
| 54                                 | 10.8                      | 3.286                                    | 16.43                     | 18.07 | 19.72 | 21.36 | 23.00 | 24.65 | 26.29 |
| 55                                 | 11.0                      | 3.317                                    | 16.58                     | 18.24 | 19.90 | 21.56 | 23.22 | 24.88 | 26.54 |
| 56                                 | 11.2                      | 3.347                                    | 16.73                     | 18.41 | 20.08 | 21.76 | 23.43 | 25.10 | 26.78 |
| 57                                 | 11.4                      | 3.376                                    | 16.88                     | 18.57 | 20.26 | 21.94 | 23.63 | 25.32 | 27.01 |
| 58                                 | 11.6                      | 3.406                                    | 17.03                     | 18.73 | 20.44 | 22.14 | 23.84 | 25.55 | 27.25 |
| 59                                 | 11.8                      | 3.435                                    | 17.18                     | 18.89 | 20.61 | 22.33 | 24.05 | 25.76 | 27.48 |
| 60                                 | 12.0                      | 3.464                                    | 17.32                     | 19.05 | 20.78 | 22.52 | 24.25 | 25.98 | 27.71 |

# FIVE PLY TWIST TABLE—(Continued)

| No. of<br>Yarn<br>to be<br>Twisted | No. of<br>Twisted<br>Yarn | Sq. Root<br>of No. of<br>Twisted<br>Yarn | TWIST PER INCH            |       |       |       |       |       |       |
|------------------------------------|---------------------------|--|---------------------------|-------|-------|-------|-------|-------|-------|
|                                    |                           |  | Square Root Multiplied by |       |       |       |       |       |       |
|                                    |                           |  | 4                         | 4½    | 5     | 5½    | 6     | 6½    | 7     |
| 61                                 | 12.2                      | 3.493                                    | 13.97                     | 15.72 | 17.47 | 19.21 | 20.96 | 22.70 | 24.45 |
| 62                                 | 12.4                      | 3.521                                    | 14.08                     | 15.84 | 17.61 | 19.37 | 21.13 | 22.89 | 24.65 |
| 63                                 | 12.6                      | 3.550                                    | 14.20                     | 15.98 | 17.75 | 19.53 | 21.30 | 23.08 | 24.85 |
| 64                                 | 12.8                      | 3.578                                    | 14.31                     | 16.10 | 17.89 | 19.68 | 21.47 | 23.26 | 25.05 |
| 65                                 | 13.0                      | 3.606                                    | 14.42                     | 16.23 | 18.03 | 19.83 | 21.63 | 23.44 | 25.24 |
| 66                                 | 13.2                      | 3.633                                    | 14.53                     | 16.35 | 18.17 | 19.98 | 21.80 | 23.61 | 25.43 |
| 67                                 | 13.4                      | 3.661                                    | 14.64                     | 16.47 | 18.31 | 20.14 | 21.97 | 23.80 | 25.63 |
| 68                                 | 13.6                      | 3.688                                    | 14.75                     | 16.60 | 18.44 | 20.28 | 22.13 | 23.97 | 25.82 |
| 69                                 | 13.8                      | 3.715                                    | 14.86                     | 16.72 | 18.58 | 20.43 | 22.29 | 24.15 | 26.01 |
| 70                                 | 14.0                      | 3.742                                    | 14.97                     | 16.84 | 18.71 | 20.58 | 22.45 | 24.32 | 26.19 |
| 71                                 | 14.2                      | 3.768                                    | 15.07                     | 16.96 | 18.84 | 20.72 | 22.61 | 24.49 | 26.38 |
| 72                                 | 14.4                      | 3.795                                    | 15.18                     | 17.08 | 18.98 | 20.87 | 22.77 | 24.67 | 26.57 |
| 73                                 | 14.6                      | 3.821                                    | 15.28                     | 17.19 | 19.10 | 21.02 | 22.93 | 24.84 | 26.75 |
| 74                                 | 14.8                      | 3.847                                    | 15.39                     | 17.31 | 19.24 | 21.16 | 23.08 | 25.01 | 26.93 |
| 75                                 | 15.0                      | 3.873                                    | 15.49                     | 17.43 | 19.37 | 21.30 | 23.24 | 25.17 | 27.11 |
| 76                                 | 15.2                      | 3.899                                    | 15.60                     | 17.55 | 19.49 | 21.44 | 23.39 | 25.34 | 27.29 |
| 77                                 | 15.4                      | 3.924                                    | 15.70                     | 17.66 | 19.62 | 21.58 | 23.55 | 25.51 | 27.47 |
| 78                                 | 15.6                      | 3.950                                    | 15.80                     | 17.78 | 19.75 | 21.73 | 23.70 | 25.68 | 27.65 |
| 79                                 | 15.8                      | 3.975                                    | 15.90                     | 17.89 | 19.87 | 21.86 | 23.85 | 25.84 | 27.83 |
| 80                                 | 16.0                      | 4.000                                    | 16.00                     | 18.00 | 20.00 | 22.00 | 24.00 | 26.00 | 28.00 |
| 81                                 | 16.2                      | 4.025                                    | 16.10                     | 18.11 | 20.12 | 22.14 | 24.15 | 26.16 | 28.18 |
| 82                                 | 16.4                      | 4.050                                    | 16.20                     | 18.23 | 20.25 | 22.28 | 24.30 | 26.33 | 28.35 |
| 83                                 | 16.6                      | 4.074                                    | 16.30                     | 18.33 | 20.37 | 22.41 | 24.45 | 26.48 | 28.52 |
| 84                                 | 16.8                      | 4.099                                    | 16.40                     | 18.45 | 20.50 | 22.54 | 24.59 | 26.64 | 28.69 |
| 85                                 | 17.0                      | 4.123                                    | 16.49                     | 18.55 | 20.62 | 22.68 | 24.74 | 26.80 | 28.86 |
| 86                                 | 17.2                      | 4.147                                    | 16.59                     | 18.66 | 20.74 | 22.81 | 24.88 | 26.96 | 29.03 |
| 87                                 | 17.4                      | 4.171                                    | 16.68                     | 18.77 | 20.86 | 22.94 | 25.03 | 27.11 | 29.20 |
| 88                                 | 17.6                      | 4.195                                    | 16.78                     | 18.88 | 20.98 | 23.07 | 25.17 | 27.27 | 29.37 |
| 89                                 | 17.8                      | 4.219                                    | 16.88                     | 18.99 | 21.10 | 23.20 | 25.31 | 27.42 | 29.53 |
| 90                                 | 18.0                      | 4.243                                    | 16.97                     | 19.09 | 21.22 | 23.34 | 25.46 | 27.58 | 29.70 |
| 91                                 | 18.2                      | 4.266                                    | 17.06                     | 19.20 | 21.33 | 23.46 | 25.60 | 27.73 | 29.86 |
| 92                                 | 18.4                      | 4.290                                    | 17.16                     | 19.31 | 21.45 | 23.60 | 25.74 | 27.89 | 30.03 |
| 93                                 | 18.6                      | 4.313                                    | 17.25                     | 19.41 | 21.56 | 23.72 | 25.88 | 28.03 | 30.19 |
| 94                                 | 18.8                      | 4.336                                    | 17.34                     | 19.51 | 21.68 | 23.85 | 26.02 | 28.18 | 30.35 |
| 95                                 | 19.0                      | 4.359                                    | 17.44                     | 19.62 | 21.80 | 23.97 | 26.15 | 28.33 | 30.51 |
| 96                                 | 19.2                      | 4.382                                    | 17.53                     | 19.72 | 21.91 | 24.10 | 26.29 | 28.48 | 30.67 |
| 97                                 | 19.4                      | 4.405                                    | 17.62                     | 19.82 | 22.03 | 24.23 | 26.43 | 28.63 | 30.84 |
| 98                                 | 19.6                      | 4.427                                    | 17.71                     | 19.92 | 22.14 | 24.35 | 26.56 | 28.78 | 30.99 |
| 99                                 | 19.8                      | 4.450                                    | 17.80                     | 20.03 | 22.25 | 24.48 | 26.70 | 28.93 | 31.15 |
| 100                                | 20.0                      | 4.472                                    | 17.89                     | 20.12 | 22.36 | 24.60 | 26.83 | 29.07 | 31.30 |
| 101                                | 20.2                      | 4.494                                    | 17.98                     | 20.22 | 22.47 | 24.72 | 26.97 | 29.21 | 31.46 |
| 102                                | 20.4                      | 4.517                                    | 18.07                     | 20.33 | 22.59 | 24.84 | 27.10 | 29.36 | 31.62 |
| 103                                | 20.6                      | 4.539                                    | 18.16                     | 20.43 | 22.70 | 24.96 | 27.23 | 29.50 | 31.77 |
| 104                                | 20.8                      | 4.561                                    | 18.24                     | 20.52 | 22.81 | 25.09 | 27.37 | 29.65 | 31.93 |
| 105                                | 21.0                      | 4.583                                    | 18.33                     | 20.62 | 22.91 | 25.21 | 27.50 | 29.79 | 32.08 |
| 106                                | 21.2                      | 4.604                                    | 18.42                     | 20.72 | 23.02 | 25.32 | 27.63 | 29.93 | 32.23 |
| 107                                | 21.4                      | 4.626                                    | 18.50                     | 20.82 | 23.13 | 25.44 | 27.76 | 30.07 | 32.38 |
| 108                                | 21.6                      | 4.648                                    | 18.59                     | 20.92 | 23.24 | 25.56 | 27.89 | 30.21 | 32.54 |
| 109                                | 21.8                      | 4.669                                    | 18.68                     | 21.01 | 23.35 | 25.68 | 28.01 | 30.35 | 32.68 |
| 110                                | 22.0                      | 4.690                                    | 18.76                     | 21.11 | 23.45 | 25.80 | 28.14 | 30.49 | 32.83 |
| 111                                | 22.2                      | 4.712                                    | 18.85                     | 21.20 | 23.56 | 25.92 | 28.27 | 30.63 | 32.98 |
| 112                                | 22.4                      | 4.733                                    | 18.93                     | 21.30 | 23.67 | 26.03 | 28.40 | 30.76 | 33.13 |
| 113                                | 22.6                      | 4.754                                    | 19.02                     | 21.39 | 23.77 | 26.15 | 28.52 | 30.90 | 33.28 |
| 114                                | 22.8                      | 4.775                                    | 19.10                     | 21.49 | 23.88 | 26.26 | 28.65 | 31.04 | 33.43 |
| 115                                | 23.0                      | 4.796                                    | 19.18                     | 21.58 | 23.98 | 26.38 | 28.78 | 31.17 | 33.57 |
| 116                                | 23.2                      | 4.817                                    | 19.27                     | 21.68 | 24.09 | 26.49 | 28.90 | 31.31 | 33.72 |
| 117                                | 23.4                      | 4.837                                    | 19.35                     | 21.77 | 24.19 | 26.60 | 29.02 | 31.44 | 33.86 |
| 118                                | 23.6                      | 4.858                                    | 19.43                     | 21.86 | 24.29 | 26.72 | 29.15 | 31.58 | 34.01 |
| 119                                | 23.8                      | 4.879                                    | 19.52                     | 21.96 | 24.40 | 26.83 | 29.27 | 31.71 | 34.15 |
| 120                                | 24.0                      | 4.899                                    | 19.60                     | 22.05 | 24.50 | 26.94 | 29.39 | 31.84 | 34.29 |

**FIVE PLY TWIST TABLE—(Continued)**

| No. of<br>Yarn<br>to be<br>Twisted | No. of<br>Twisted<br>Yarn | Sq. Root<br>of No. of<br>Twisted<br>Yarn | TWIST PER INCH            |                 |       |                 |       |                 |       |
|------------------------------------|---------------------------|--|---------------------------|-----------------|-------|-----------------|-------|-----------------|-------|
|                                    |                           |  | Square Root Multiplied by |                 |       |                 |       |                 |       |
|                                    |                           |  | 4                         | 4 $\frac{1}{2}$ | 5     | 5 $\frac{1}{2}$ | 6     | 6 $\frac{1}{2}$ | 7     |
| 121                                | 24.2                      | 4.919                                    | 19.68                     | 22.14           | 24.60 | 27.05           | 29.51 | 31.97           | 34.43 |
| 122                                | 24.4                      | 4.940                                    | 19.76                     | 22.23           | 24.70 | 27.17           | 29.64 | 32.11           | 34.58 |
| 123                                | 24.6                      | 4.960                                    | 19.84                     | 22.32           | 24.80 | 27.28           | 29.76 | 32.24           | 34.72 |
| 124                                | 24.8                      | 4.980                                    | 19.92                     | 22.41           | 24.90 | 27.39           | 29.88 | 32.37           | 34.86 |
| 125                                | 25.0                      | 5.000                                    | 20.00                     | 22.50           | 25.00 | 27.50           | 30.00 | 32.50           | 35.00 |
| 126                                | 25.2                      | 5.020                                    | 20.08                     | 22.59           | 25.10 | 27.61           | 30.12 | 32.63           | 35.14 |
| 127                                | 25.4                      | 5.040                                    | 20.16                     | 22.68           | 25.20 | 27.72           | 30.24 | 32.76           | 35.28 |
| 128                                | 25.6                      | 5.060                                    | 20.24                     | 22.77           | 25.30 | 27.83           | 30.36 | 32.89           | 35.42 |
| 129                                | 25.8                      | 5.079                                    | 20.32                     | 22.86           | 25.40 | 27.93           | 30.47 | 33.01           | 35.55 |
| 130                                | 26.0                      | 5.099                                    | 20.40                     | 22.95           | 25.50 | 28.04           | 30.59 | 33.14           | 35.69 |
| 131                                | 26.2                      | 5.119                                    | 20.48                     | 23.04           | 25.60 | 28.15           | 30.71 | 33.27           | 35.83 |
| 132                                | 26.4                      | 5.138                                    | 20.55                     | 23.12           | 25.69 | 28.26           | 30.83 | 33.40           | 35.97 |
| 133                                | 26.6                      | 5.158                                    | 20.63                     | 23.21           | 25.79 | 28.37           | 30.95 | 33.53           | 36.11 |
| 134                                | 26.8                      | 5.177                                    | 20.71                     | 23.30           | 25.89 | 28.47           | 31.06 | 33.65           | 36.24 |
| 135                                | 27.0                      | 5.196                                    | 20.78                     | 23.38           | 25.98 | 28.58           | 31.18 | 33.77           | 36.37 |
| 136                                | 27.2                      | 5.215                                    | 20.86                     | 23.47           | 26.08 | 28.68           | 31.29 | 33.90           | 36.51 |
| 137                                | 27.4                      | 5.235                                    | 20.94                     | 23.56           | 26.18 | 28.79           | 31.41 | 34.03           | 36.65 |
| 138                                | 27.6                      | 5.254                                    | 21.02                     | 23.64           | 26.27 | 28.90           | 31.52 | 34.15           | 36.78 |
| 139                                | 27.8                      | 5.273                                    | 21.09                     | 23.73           | 26.37 | 29.00           | 31.64 | 34.27           | 36.91 |
| 140                                | 28.0                      | 5.292                                    | 21.17                     | 23.81           | 26.46 | 29.11           | 31.75 | 34.40           | 37.04 |
| 141                                | 28.2                      | 5.310                                    | 21.24                     | 23.90           | 26.55 | 29.21           | 31.86 | 34.52           | 37.17 |
| 142                                | 28.4                      | 5.329                                    | 21.32                     | 23.98           | 26.65 | 29.31           | 31.97 | 34.64           | 37.30 |
| 143                                | 28.6                      | 5.348                                    | 21.39                     | 24.07           | 26.74 | 29.41           | 32.09 | 34.76           | 37.44 |
| 144                                | 28.8                      | 5.367                                    | 21.47                     | 24.15           | 26.84 | 29.52           | 32.20 | 34.89           | 37.57 |
| 145                                | 29.0                      | 5.385                                    | 21.54                     | 24.23           | 26.93 | 29.62           | 32.31 | 35.00           | 37.70 |
| 146                                | 29.2                      | 5.404                                    | 21.62                     | 24.32           | 27.02 | 29.72           | 32.42 | 35.13           | 37.83 |
| 147                                | 29.4                      | 5.422                                    | 21.69                     | 24.40           | 27.11 | 29.82           | 32.53 | 35.24           | 37.95 |
| 148                                | 29.6                      | 5.441                                    | 21.76                     | 24.48           | 27.21 | 29.93           | 32.65 | 35.37           | 38.09 |
| 149                                | 29.8                      | 5.459                                    | 21.84                     | 24.57           | 27.30 | 30.02           | 32.75 | 35.48           | 38.21 |
| 150                                | 30.0                      | 5.477                                    | 21.91                     | 24.65           | 27.39 | 30.12           | 32.86 | 35.60           | 38.34 |
| 151                                | 30.2                      | 5.495                                    | 21.98                     | 24.73           | 27.48 | 30.22           | 32.97 | 35.72           | 38.47 |
| 152                                | 30.4                      | 5.514                                    | 22.06                     | 24.81           | 27.57 | 30.33           | 33.08 | 35.84           | 38.60 |
| 153                                | 30.6                      | 5.532                                    | 22.13                     | 24.89           | 27.66 | 30.43           | 33.19 | 35.96           | 38.72 |
| 154                                | 30.8                      | 5.550                                    | 22.20                     | 24.98           | 27.75 | 30.53           | 33.30 | 36.08           | 38.85 |
| 155                                | 31.0                      | 5.568                                    | 22.27                     | 25.06           | 27.84 | 30.62           | 33.41 | 36.19           | 38.98 |
| 156                                | 31.2                      | 5.586                                    | 22.34                     | 25.14           | 27.93 | 30.72           | 33.52 | 36.31           | 39.10 |
| 157                                | 31.4                      | 5.604                                    | 22.42                     | 25.22           | 28.02 | 30.82           | 33.62 | 36.43           | 39.23 |
| 158                                | 31.6                      | 5.621                                    | 22.48                     | 25.29           | 28.11 | 30.92           | 33.73 | 36.54           | 39.35 |
| 159                                | 31.8                      | 5.639                                    | 22.56                     | 25.38           | 28.20 | 31.01           | 33.83 | 36.65           | 39.47 |
| 160                                | 32.0                      | 5.657                                    | 22.63                     | 25.46           | 28.29 | 31.11           | 33.94 | 36.77           | 39.60 |
| 161                                | 32.2                      | 5.675                                    | 22.70                     | 25.54           | 28.38 | 31.21           | 34.05 | 36.89           | 39.73 |
| 162                                | 32.4                      | 5.692                                    | 22.77                     | 25.61           | 28.46 | 31.31           | 34.15 | 37.00           | 39.84 |
| 163                                | 32.6                      | 5.710                                    | 22.84                     | 25.70           | 28.55 | 31.41           | 34.26 | 37.12           | 39.97 |
| 164                                | 32.8                      | 5.727                                    | 22.91                     | 25.77           | 28.64 | 31.50           | 34.36 | 37.23           | 40.09 |
| 165                                | 33.0                      | 5.745                                    | 22.98                     | 25.85           | 28.73 | 31.60           | 34.47 | 37.34           | 40.22 |
| 166                                | 33.2                      | 5.762                                    | 23.05                     | 25.93           | 28.81 | 31.69           | 34.57 | 37.45           | 40.33 |
| 167                                | 33.4                      | 5.779                                    | 23.12                     | 26.01           | 28.90 | 31.78           | 34.67 | 37.56           | 40.45 |
| 168                                | 33.6                      | 5.797                                    | 23.19                     | 26.09           | 28.99 | 31.88           | 34.78 | 37.68           | 40.58 |
| 169                                | 33.8                      | 5.814                                    | 23.26                     | 26.16           | 29.07 | 31.98           | 34.88 | 37.79           | 40.70 |
| 170                                | 34.0                      | 5.831                                    | 23.32                     | 26.24           | 29.16 | 32.07           | 34.99 | 37.90           | 40.82 |
| 171                                | 34.2                      | 5.848                                    | 23.39                     | 26.32           | 29.24 | 32.16           | 35.09 | 38.01           | 40.94 |
| 172                                | 34.4                      | 5.865                                    | 23.46                     | 26.40           | 29.33 | 32.26           | 35.19 | 38.13           | 41.06 |
| 173                                | 34.6                      | 5.882                                    | 23.53                     | 26.47           | 29.41 | 32.35           | 35.29 | 38.23           | 41.17 |
| 174                                | 34.8                      | 5.899                                    | 23.60                     | 26.55           | 29.50 | 32.44           | 35.39 | 38.34           | 41.29 |
| 175                                | 35.0                      | 5.916                                    | 23.66                     | 26.62           | 29.58 | 32.54           | 35.50 | 38.45           | 41.41 |
| 176                                | 35.2                      | 5.933                                    | 23.73                     | 26.70           | 29.67 | 32.63           | 35.60 | 38.56           | 41.53 |
| 177                                | 35.4                      | 5.950                                    | 23.80                     | 26.78           | 29.75 | 32.73           | 35.70 | 38.68           | 41.65 |
| 178                                | 35.6                      | 5.967                                    | 23.87                     | 26.85           | 29.84 | 32.82           | 35.80 | 38.79           | 41.77 |
| 179                                | 35.8                      | 5.983                                    | 23.93                     | 26.92           | 29.92 | 32.91           | 35.90 | 38.89           | 41.88 |
| 180                                | 36.0                      | 6.000                                    | 24.00                     | 27.00           | 30.00 | 33.00           | 36.00 | 39.00           | 42.00 |

# SIX PLY TWIST TABLE

| No. of<br>Yarn<br>to be<br>Twisted | No. of<br>Twisted<br>Yarn | Sq. Root<br>of No. of<br>Twisted<br>Yarn | TWIST PER INCH            |      |                |      |                |       |                |
|------------------------------------|---------------------------|--|---------------------------|------|----------------|------|----------------|-------|----------------|
|                                    |                           |  | Square Root Multiplied by |      |                |      |                |       |                |
|                                    |                           |  | $1\frac{1}{2}$            | 2    | $2\frac{1}{2}$ | 3    | $3\frac{1}{2}$ | 4     | $4\frac{1}{2}$ |
| 1                                  | .17                       | .408                                     | .61                       | .82  | 1.02           | 1.22 | 1.43           | 1.63  | 1.84           |
| 2                                  | .33                       | .577                                     | .87                       | 1.15 | 1.44           | 1.73 | 2.02           | 2.31  | 2.60           |
| 3                                  | .50                       | .707                                     | 1.06                      | 1.41 | 1.77           | 2.12 | 2.47           | 2.83  | 3.18           |
| 4                                  | .67                       | .817                                     | 1.23                      | 1.63 | 2.04           | 2.45 | 2.86           | 3.27  | 3.68           |
| 5                                  | .83                       | .913                                     | 1.37                      | 1.83 | 2.28           | 2.74 | 3.20           | 3.65  | 4.11           |
| 6                                  | 1.00                      | 1.000                                    | 1.50                      | 2.00 | 2.50           | 3.00 | 3.50           | 4.00  | 4.50           |
| 7                                  | 1.17                      | 1.080                                    | 1.62                      | 2.16 | 2.70           | 3.24 | 3.78           | 4.32  | 4.86           |
| 8                                  | 1.33                      | 1.155                                    | 1.73                      | 2.31 | 2.89           | 3.47 | 4.04           | 4.62  | 5.20           |
| 9                                  | 1.50                      | 1.225                                    | 1.84                      | 2.45 | 3.06           | 3.68 | 4.29           | 4.90  | 5.51           |
| 10                                 | 1.67                      | 1.291                                    | 1.94                      | 2.58 | 3.23           | 3.87 | 4.52           | 5.16  | 5.81           |
| 11                                 | 1.83                      | 1.354                                    | 2.03                      | 2.71 | 3.39           | 4.06 | 4.74           | 5.42  | 6.09           |
| 12                                 | 2.00                      | 1.414                                    | 2.12                      | 2.83 | 3.54           | 4.24 | 4.95           | 5.66  | 6.36           |
| 13                                 | 2.17                      | 1.472                                    | 2.21                      | 2.94 | 3.68           | 4.42 | 5.15           | 5.89  | 6.62           |
| 14                                 | 2.33                      | 1.528                                    | 2.29                      | 3.06 | 3.82           | 4.58 | 5.35           | 6.11  | 6.88           |
| 15                                 | 2.50                      | 1.581                                    | 2.37                      | 3.16 | 3.95           | 4.74 | 5.53           | 6.32  | 7.11           |
| 16                                 | 2.67                      | 1.633                                    | 2.45                      | 3.27 | 4.08           | 4.90 | 5.72           | 6.53  | 7.35           |
| 17                                 | 2.83                      | 1.683                                    | 2.52                      | 3.37 | 4.21           | 5.05 | 5.89           | 6.73  | 7.57           |
| 18                                 | 3.00                      | 1.732                                    | 2.60                      | 3.46 | 4.33           | 5.20 | 6.06           | 6.93  | 7.79           |
| 19                                 | 3.17                      | 1.780                                    | 2.67                      | 3.56 | 4.45           | 5.34 | 6.23           | 7.12  | 8.01           |
| 20                                 | 3.33                      | 1.826                                    | 2.74                      | 3.65 | 4.56           | 5.48 | 6.39           | 7.30  | 8.21           |
| 21                                 | 3.50                      | 1.871                                    | 2.81                      | 3.74 | 4.68           | 5.61 | 6.55           | 7.48  | 8.42           |
| 22                                 | 3.67                      | 1.915                                    | 2.87                      | 3.83 | 4.79           | 5.75 | 6.70           | 7.66  | 8.62           |
| 23                                 | 3.83                      | 1.958                                    | 2.94                      | 3.92 | 4.90           | 5.87 | 6.85           | 7.83  | 8.81           |
| 24                                 | 4.00                      | 2.000                                    | 3.00                      | 4.00 | 5.00           | 6.00 | 7.00           | 8.00  | 9.00           |
| 25                                 | 4.17                      | 2.041                                    | 3.06                      | 4.08 | 5.10           | 6.12 | 7.14           | 8.16  | 9.18           |
| 26                                 | 4.33                      | 2.082                                    | 3.12                      | 4.16 | 5.21           | 6.25 | 7.29           | 8.33  | 9.37           |
| 27                                 | 4.50                      | 2.121                                    | 3.18                      | 4.24 | 5.30           | 6.36 | 7.42           | 8.48  | 9.54           |
| 28                                 | 4.67                      | 2.160                                    | 3.24                      | 4.32 | 5.40           | 6.48 | 7.56           | 8.64  | 9.72           |
| 29                                 | 4.83                      | 2.199                                    | 3.30                      | 4.40 | 5.50           | 6.60 | 7.70           | 8.80  | 9.90           |
| 30                                 | 5.00                      | 2.236                                    | 3.35                      | 4.47 | 5.59           | 6.71 | 7.83           | 8.94  | 10.06          |
| 31                                 | 5.17                      | 2.273                                    | 3.41                      | 4.55 | 5.68           | 6.82 | 7.96           | 9.09  | 10.23          |
| 32                                 | 5.33                      | 2.309                                    | 3.46                      | 4.62 | 5.77           | 6.93 | 8.08           | 9.24  | 10.39          |
| 33                                 | 5.50                      | 2.345                                    | 3.52                      | 4.69 | 5.86           | 7.04 | 8.21           | 9.38  | 10.55          |
| 34                                 | 5.67                      | 2.381                                    | 3.57                      | 4.76 | 5.95           | 7.14 | 8.33           | 9.52  | 10.71          |
| 35                                 | 5.83                      | 2.415                                    | 3.62                      | 4.83 | 6.04           | 7.25 | 8.45           | 9.66  | 10.87          |
| 36                                 | 6.00                      | 2.449                                    | 3.67                      | 4.90 | 6.13           | 7.35 | 8.58           | 9.80  | 11.03          |
| 37                                 | 6.17                      | 2.483                                    | 3.72                      | 4.97 | 6.21           | 7.45 | 8.69           | 9.93  | 11.17          |
| 38                                 | 6.33                      | 2.517                                    | 3.78                      | 5.03 | 6.29           | 7.55 | 8.81           | 10.07 | 11.33          |
| 39                                 | 6.50                      | 2.550                                    | 3.83                      | 5.10 | 6.38           | 7.65 | 8.93           | 10.20 | 11.47          |
| 40                                 | 6.67                      | 2.582                                    | 3.87                      | 5.16 | 6.46           | 7.75 | 9.04           | 10.33 | 11.62          |
| 41                                 | 6.83                      | 2.614                                    | 3.92                      | 5.23 | 6.54           | 7.84 | 9.15           | 10.46 | 11.76          |
| 42                                 | 7.00                      | 2.646                                    | 3.97                      | 5.29 | 6.62           | 7.94 | 9.26           | 10.58 | 11.91          |
| 43                                 | 7.17                      | 2.677                                    | 4.02                      | 5.35 | 6.69           | 8.03 | 9.37           | 10.71 | 12.05          |
| 44                                 | 7.33                      | 2.708                                    | 4.06                      | 5.42 | 6.77           | 8.12 | 9.48           | 10.83 | 12.19          |
| 45                                 | 7.50                      | 2.739                                    | 4.11                      | 5.48 | 6.85           | 8.22 | 9.59           | 10.96 | 12.33          |
| 46                                 | 7.67                      | 2.769                                    | 4.15                      | 5.54 | 6.92           | 8.31 | 9.69           | 11.08 | 12.46          |
| 47                                 | 7.83                      | 2.798                                    | 4.20                      | 5.60 | 7.00           | 8.39 | 9.79           | 11.19 | 12.59          |
| 48                                 | 8.00                      | 2.828                                    | 4.24                      | 5.66 | 7.07           | 8.48 | 9.90           | 11.31 | 12.73          |
| 49                                 | 8.17                      | 2.858                                    | 4.29                      | 5.72 | 7.15           | 8.57 | 10.00          | 11.43 | 12.86          |
| 50                                 | 8.33                      | 2.887                                    | 4.33                      | 5.77 | 7.22           | 8.66 | 10.10          | 11.55 | 12.99          |
| 51                                 | 8.50                      | 2.916                                    | 4.37                      | 5.83 | 7.29           | 8.75 | 10.21          | 11.66 | 13.12          |
| 52                                 | 8.67                      | 2.944                                    | 4.42                      | 5.89 | 7.36           | 8.83 | 10.30          | 11.78 | 13.25          |
| 53                                 | 8.83                      | 2.972                                    | 4.46                      | 5.94 | 7.43           | 8.92 | 10.40          | 11.89 | 13.37          |
| 54                                 | 9.00                      | 3.000                                    | 4.50                      | 6.00 | 7.50           | 9.00 | 10.50          | 12.00 | 13.50          |
| 55                                 | 9.17                      | 3.028                                    | 4.54                      | 6.05 | 7.57           | 9.08 | 10.60          | 12.11 | 13.63          |
| 56                                 | 9.33                      | 3.055                                    | 4.58                      | 6.11 | 7.64           | 9.17 | 10.69          | 12.22 | 13.75          |
| 57                                 | 9.50                      | 3.082                                    | 4.62                      | 6.16 | 7.71           | 9.25 | 10.79          | 12.33 | 13.87          |
| 58                                 | 9.67                      | 3.109                                    | 4.66                      | 6.22 | 7.77           | 9.33 | 10.88          | 12.44 | 13.99          |
| 59                                 | 9.83                      | 3.136                                    | 4.70                      | 6.27 | 7.84           | 9.41 | 10.98          | 12.54 | 14.11          |
| 60                                 | 10.00                     | 3.162                                    | 4.74                      | 6.32 | 7.91           | 9.49 | 11.07          | 12.65 | 14.23          |



# SIX PLY TWIST TABLE — (Continued)

| No. of<br>Yarn<br>to be<br>Twisted | No. of<br>Twisted<br>Yarn | Sq. Root<br>of No. of<br>Twisted<br>Yarn | TWIST PER INCH            |       |       |       |       |       |       |
|------------------------------------|---------------------------|--|---------------------------|-------|-------|-------|-------|-------|-------|
|                                    |                           |  | Square Root Multiplied by |       |       |       |       |       |       |
|                                    |                           |  | 5                         | 5½    | 6     | 6½    | 7     | 7½    | 8     |
| 1                                  | .17                       | .408                                     | 2.04                      | 2.24  | 2.45  | 2.65  | 2.86  | 3.06  | 3.26  |
| 2                                  | .33                       | .577                                     | 2.89                      | 3.17  | 3.46  | 3.75  | 4.04  | 4.33  | 4.62  |
| 3                                  | .50                       | .707                                     | 3.54                      | 3.89  | 4.24  | 4.60  | 4.95  | 5.30  | 5.66  |
| 4                                  | .67                       | .817                                     | 4.08                      | 4.49  | 4.90  | 5.31  | 5.72  | 6.13  | 6.54  |
| 5                                  | .83                       | .913                                     | 4.56                      | 5.02  | 5.48  | 5.93  | 6.39  | 6.85  | 7.30  |
| 6                                  | 1.00                      | 1.000                                    | 5.00                      | 5.50  | 6.00  | 6.50  | 7.00  | 7.50  | 8.00  |
| 7                                  | 1.17                      | 1.080                                    | 5.40                      | 5.94  | 6.48  | 7.02  | 7.56  | 8.10  | 8.64  |
| 8                                  | 1.33                      | 1.155                                    | 5.77                      | 6.35  | 6.93  | 7.51  | 8.08  | 8.66  | 9.24  |
| 9                                  | 1.50                      | 1.225                                    | 6.12                      | 6.74  | 7.35  | 7.96  | 8.57  | 9.19  | 9.80  |
| 10                                 | 1.67                      | 1.291                                    | 6.45                      | 7.10  | 7.75  | 8.39  | 9.04  | 9.68  | 10.33 |
| 11                                 | 1.83                      | 1.354                                    | 6.77                      | 7.45  | 8.12  | 8.80  | 9.48  | 10.15 | 10.83 |
| 12                                 | 2.00                      | 1.414                                    | 7.07                      | 7.78  | 8.49  | 9.19  | 9.90  | 10.61 | 11.31 |
| 13                                 | 2.17                      | 1.472                                    | 7.36                      | 8.10  | 8.83  | 9.57  | 10.30 | 11.04 | 11.78 |
| 14                                 | 2.33                      | 1.528                                    | 7.64                      | 8.40  | 9.17  | 9.93  | 10.70 | 11.46 | 12.22 |
| 15                                 | 2.50                      | 1.581                                    | 7.91                      | 8.70  | 9.49  | 10.28 | 11.07 | 11.86 | 12.65 |
| 16                                 | 2.67                      | 1.633                                    | 8.17                      | 8.98  | 9.80  | 10.61 | 11.43 | 12.25 | 13.06 |
| 17                                 | 2.83                      | 1.683                                    | 8.42                      | 9.26  | 10.10 | 10.94 | 11.78 | 12.62 | 13.46 |
| 18                                 | 3.00                      | 1.732                                    | 8.66                      | 9.53  | 10.39 | 11.26 | 12.12 | 12.99 | 13.86 |
| 19                                 | 3.17                      | 1.780                                    | 8.90                      | 9.79  | 10.68 | 11.57 | 12.46 | 13.35 | 14.24 |
| 20                                 | 3.33                      | 1.826                                    | 9.13                      | 10.04 | 10.96 | 11.87 | 12.78 | 13.70 | 14.61 |
| 21                                 | 3.50                      | 1.871                                    | 9.36                      | 10.29 | 11.23 | 12.16 | 13.10 | 14.03 | 14.97 |
| 22                                 | 3.67                      | 1.915                                    | 9.58                      | 10.53 | 11.49 | 12.45 | 13.41 | 14.36 | 15.32 |
| 23                                 | 3.83                      | 1.958                                    | 9.79                      | 10.77 | 11.75 | 12.73 | 13.71 | 14.69 | 15.66 |
| 24                                 | 4.00                      | 2.000                                    | 10.00                     | 11.00 | 12.00 | 13.00 | 14.00 | 15.00 | 16.00 |
| 25                                 | 4.17                      | 2.041                                    | 10.21                     | 11.23 | 12.25 | 13.27 | 14.29 | 15.31 | 16.33 |
| 26                                 | 4.33                      | 2.082                                    | 10.41                     | 11.45 | 12.49 | 13.53 | 14.57 | 15.62 | 16.66 |
| 27                                 | 4.50                      | 2.121                                    | 10.61                     | 11.67 | 12.73 | 13.79 | 14.85 | 15.91 | 16.97 |
| 28                                 | 4.67                      | 2.160                                    | 10.80                     | 11.88 | 12.96 | 14.04 | 15.12 | 16.20 | 17.28 |
| 29                                 | 4.83                      | 2.199                                    | 10.99                     | 12.09 | 13.19 | 14.29 | 15.39 | 16.49 | 17.59 |
| 30                                 | 5.00                      | 2.236                                    | 11.18                     | 12.30 | 13.42 | 14.53 | 15.65 | 16.77 | 17.89 |
| 31                                 | 5.17                      | 2.273                                    | 11.37                     | 12.50 | 13.64 | 14.77 | 15.91 | 17.05 | 18.18 |
| 32                                 | 5.33                      | 2.309                                    | 11.55                     | 12.70 | 13.86 | 15.01 | 16.16 | 17.32 | 18.47 |
| 33                                 | 5.50                      | 2.345                                    | 11.73                     | 12.90 | 14.07 | 15.24 | 16.42 | 17.59 | 18.76 |
| 34                                 | 5.67                      | 2.381                                    | 11.90                     | 13.09 | 14.28 | 15.48 | 16.67 | 17.86 | 19.05 |
| 35                                 | 5.83                      | 2.415                                    | 12.08                     | 13.28 | 14.49 | 15.70 | 16.91 | 18.11 | 19.32 |
| 36                                 | 6.00                      | 2.449                                    | 12.25                     | 13.47 | 14.70 | 15.92 | 17.15 | 18.37 | 19.59 |
| 37                                 | 6.17                      | 2.483                                    | 12.42                     | 13.66 | 14.90 | 16.14 | 17.38 | 18.62 | 19.86 |
| 38                                 | 6.33                      | 2.517                                    | 12.58                     | 13.84 | 15.10 | 16.36 | 17.62 | 18.88 | 20.14 |
| 39                                 | 6.50                      | 2.550                                    | 12.75                     | 14.03 | 15.30 | 16.58 | 17.85 | 19.13 | 20.40 |
| 40                                 | 6.67                      | 2.582                                    | 12.91                     | 14.20 | 15.49 | 16.78 | 18.07 | 19.37 | 20.66 |
| 41                                 | 6.83                      | 2.614                                    | 13.07                     | 14.38 | 15.68 | 16.99 | 18.30 | 19.61 | 20.91 |
| 42                                 | 7.00                      | 2.646                                    | 13.23                     | 14.55 | 15.88 | 17.20 | 18.52 | 19.85 | 21.17 |
| 43                                 | 7.17                      | 2.677                                    | 13.39                     | 14.72 | 16.06 | 17.40 | 18.74 | 20.08 | 21.42 |
| 44                                 | 7.33                      | 2.708                                    | 13.54                     | 14.89 | 16.25 | 17.60 | 18.96 | 20.31 | 21.66 |
| 45                                 | 7.50                      | 2.739                                    | 13.69                     | 15.06 | 16.43 | 17.80 | 19.17 | 20.54 | 21.91 |
| 46                                 | 7.67                      | 2.769                                    | 13.85                     | 15.23 | 16.61 | 18.00 | 19.38 | 20.77 | 22.15 |
| 47                                 | 7.83                      | 2.798                                    | 13.99                     | 15.39 | 16.79 | 18.19 | 19.59 | 20.99 | 22.38 |
| 48                                 | 8.00                      | 2.828                                    | 14.14                     | 15.55 | 16.97 | 18.38 | 19.80 | 21.21 | 22.62 |
| 49                                 | 8.17                      | 2.858                                    | 14.29                     | 15.72 | 17.15 | 18.58 | 20.01 | 21.44 | 22.86 |
| 50                                 | 8.33                      | 2.887                                    | 14.44                     | 15.88 | 17.32 | 18.77 | 20.21 | 21.65 | 23.10 |
| 51                                 | 8.50                      | 2.916                                    | 14.58                     | 16.04 | 17.50 | 18.95 | 20.41 | 21.87 | 23.33 |
| 52                                 | 8.67                      | 2.944                                    | 14.72                     | 16.19 | 17.66 | 19.14 | 20.61 | 22.08 | 23.55 |
| 53                                 | 8.83                      | 2.972                                    | 14.86                     | 16.35 | 17.83 | 19.32 | 20.80 | 22.29 | 23.78 |
| 54                                 | 9.00                      | 3.000                                    | 15.00                     | 16.50 | 18.00 | 19.50 | 21.00 | 22.50 | 24.00 |
| 55                                 | 9.17                      | 3.028                                    | 15.14                     | 16.65 | 18.17 | 19.68 | 21.20 | 22.71 | 24.22 |
| 56                                 | 9.33                      | 3.055                                    | 15.28                     | 16.80 | 18.33 | 19.86 | 21.39 | 22.91 | 24.44 |
| 57                                 | 9.50                      | 3.082                                    | 15.41                     | 16.95 | 18.49 | 20.03 | 21.57 | 23.12 | 24.66 |
| 58                                 | 9.67                      | 3.109                                    | 15.55                     | 17.10 | 18.65 | 20.21 | 21.76 | 23.32 | 24.87 |
| 59                                 | 9.83                      | 3.136                                    | 15.68                     | 17.25 | 18.82 | 20.38 | 21.95 | 23.52 | 25.09 |
| 60                                 | 10.00                     | 3.162                                    | 15.81                     | 17.39 | 18.97 | 20.55 | 22.13 | 23.72 | 25.30 |

**SIX PLY TWIST TABLE** —(Continued)

| No. of<br>Yarn<br>to be<br>Twisted | No. of<br>Twisted<br>Yarn | Sq. Root<br>of No. of<br>Twisted<br>Yarn | TWIST PER INCH            |       |       |       |       |       |       |
|------------------------------------|---------------------------|--|---------------------------|-------|-------|-------|-------|-------|-------|
|                                    |                           |  | Square Root Multiplied by |       |       |       |       |       |       |
|                                    |                           |  | 4                         | 4½    | 5     | 5½    | 6     | 6½    | 7     |
| 61                                 | 10:17                     | 3.189                                    | 12.76                     | 14.35 | 15.94 | 17.54 | 19.13 | 20.73 | 22.32 |
| 62                                 | 10.33                     | 3.215                                    | 12.86                     | 14.47 | 16.07 | 17.68 | 19.29 | 20.90 | 22.50 |
| 63                                 | 10.50                     | 3.240                                    | 12.96                     | 14.58 | 16.20 | 17.82 | 19.44 | 21.06 | 22.68 |
| 64                                 | 10.67                     | 3.266                                    | 13.06                     | 14.70 | 16.33 | 17.96 | 19.60 | 21.23 | 22.86 |
| 65                                 | 10.83                     | 3.291                                    | 13.16                     | 14.81 | 16.46 | 18.10 | 19.75 | 21.39 | 23.04 |
| 66                                 | 11.00                     | 3.317                                    | 13.27                     | 14.93 | 16.58 | 18.24 | 19.90 | 21.56 | 23.22 |
| 67                                 | 11.17                     | 3.342                                    | 13.37                     | 15.04 | 16.71 | 18.38 | 20.05 | 21.72 | 23.39 |
| 68                                 | 11.33                     | 3.367                                    | 13.47                     | 15.15 | 16.83 | 18.52 | 20.20 | 21.88 | 23.57 |
| 69                                 | 11.50                     | 3.391                                    | 13.56                     | 15.26 | 16.96 | 18.65 | 20.35 | 22.04 | 23.74 |
| 70                                 | 11.67                     | 3.416                                    | 13.66                     | 15.37 | 17.08 | 18.79 | 20.50 | 22.20 | 23.91 |
| 71                                 | 11.83                     | 3.440                                    | 13.76                     | 15.48 | 17.20 | 18.92 | 20.64 | 22.36 | 24.08 |
| 72                                 | 12.00                     | 3.464                                    | 13.86                     | 15.59 | 17.32 | 19.05 | 20.78 | 22.52 | 24.25 |
| 73                                 | 12.17                     | 3.488                                    | 13.95                     | 15.70 | 17.44 | 19.18 | 20.93 | 22.67 | 24.42 |
| 74                                 | 12.33                     | 3.512                                    | 14.05                     | 15.80 | 17.56 | 19.32 | 21.07 | 22.83 | 24.58 |
| 75                                 | 12.50                     | 3.536                                    | 14.14                     | 15.91 | 17.68 | 19.45 | 21.21 | 22.98 | 24.75 |
| 76                                 | 12.67                     | 3.559                                    | 14.24                     | 16.02 | 17.80 | 19.57 | 21.35 | 23.13 | 24.91 |
| 77                                 | 12.83                     | 3.582                                    | 14.33                     | 16.12 | 17.91 | 19.70 | 21.49 | 23.28 | 25.07 |
| 78                                 | 13.00                     | 3.606                                    | 14.42                     | 16.23 | 18.03 | 19.83 | 21.63 | 23.44 | 25.24 |
| 79                                 | 13.17                     | 3.629                                    | 14.52                     | 16.33 | 18.14 | 19.96 | 21.77 | 23.59 | 25.40 |
| 80                                 | 13.33                     | 3.651                                    | 14.60                     | 16.43 | 18.26 | 20.09 | 21.91 | 23.74 | 25.56 |
| 81                                 | 13.50                     | 3.674                                    | 14.70                     | 16.53 | 18.37 | 20.21 | 22.04 | 23.88 | 25.72 |
| 82                                 | 13.67                     | 3.697                                    | 14.79                     | 16.64 | 18.48 | 20.33 | 22.18 | 24.03 | 25.88 |
| 83                                 | 13.83                     | 3.719                                    | 14.88                     | 16.74 | 18.60 | 20.45 | 22.31 | 24.17 | 26.03 |
| 84                                 | 14.00                     | 3.742                                    | 14.97                     | 16.84 | 18.71 | 20.58 | 22.45 | 24.32 | 26.19 |
| 85                                 | 14.17                     | 3.764                                    | 15.06                     | 16.94 | 18.82 | 20.70 | 22.58 | 24.47 | 26.35 |
| 86                                 | 14.33                     | 3.786                                    | 15.14                     | 17.04 | 18.93 | 20.82 | 22.72 | 24.61 | 26.50 |
| 87                                 | 14.50                     | 3.808                                    | 15.23                     | 17.14 | 19.04 | 20.94 | 22.85 | 24.75 | 26.66 |
| 88                                 | 14.67                     | 3.830                                    | 15.32                     | 17.24 | 19.15 | 21.07 | 22.98 | 24.89 | 26.81 |
| 89                                 | 14.83                     | 3.851                                    | 15.40                     | 17.33 | 19.26 | 21.18 | 23.11 | 25.03 | 26.96 |
| 90                                 | 15.00                     | 3.873                                    | 15.49                     | 17.43 | 19.36 | 21.30 | 23.24 | 25.17 | 27.11 |
| 91                                 | 15.17                     | 3.894                                    | 15.58                     | 17.52 | 19.47 | 21.42 | 23.37 | 25.31 | 27.26 |
| 92                                 | 15.33                     | 3.916                                    | 15.66                     | 17.62 | 19.58 | 21.54 | 23.50 | 25.45 | 27.41 |
| 93                                 | 15.50                     | 3.937                                    | 15.75                     | 17.72 | 19.69 | 21.65 | 23.62 | 25.59 | 27.56 |
| 94                                 | 15.67                     | 3.958                                    | 15.83                     | 17.81 | 19.79 | 21.77 | 23.75 | 25.73 | 27.71 |
| 95                                 | 15.83                     | 3.979                                    | 15.92                     | 17.91 | 19.90 | 21.88 | 23.87 | 25.86 | 27.85 |
| 96                                 | 16.00                     | 4.000                                    | 16.00                     | 18.00 | 20.00 | 22.00 | 24.00 | 26.00 | 28.00 |
| 97                                 | 16.17                     | 4.021                                    | 16.08                     | 18.09 | 20.10 | 22.12 | 24.13 | 26.14 | 28.15 |
| 98                                 | 16.33                     | 4.042                                    | 16.17                     | 18.19 | 20.21 | 22.23 | 24.25 | 26.27 | 28.29 |
| 99                                 | 16.50                     | 4.062                                    | 16.25                     | 18.28 | 20.31 | 22.34 | 24.37 | 26.40 | 28.43 |
| 100                                | 16.67                     | 4.082                                    | 16.33                     | 18.37 | 20.41 | 22.45 | 24.49 | 26.53 | 28.57 |
| 101                                | 16.83                     | 4.103                                    | 16.41                     | 18.46 | 20.51 | 22.57 | 24.62 | 26.67 | 28.72 |
| 102                                | 17.00                     | 4.123                                    | 16.49                     | 18.55 | 20.62 | 22.68 | 24.74 | 26.80 | 28.86 |
| 103                                | 17.17                     | 4.143                                    | 16.57                     | 18.64 | 20.72 | 22.79 | 24.86 | 26.93 | 29.00 |
| 104                                | 17.33                     | 4.163                                    | 16.65                     | 18.73 | 20.82 | 22.90 | 24.98 | 27.06 | 29.14 |
| 105                                | 17.50                     | 4.183                                    | 16.73                     | 18.82 | 20.92 | 23.01 | 25.10 | 27.19 | 29.28 |
| 106                                | 17.67                     | 4.203                                    | 16.81                     | 18.91 | 21.02 | 23.12 | 25.22 | 27.32 | 29.42 |
| 107                                | 17.83                     | 4.223                                    | 16.89                     | 19.00 | 21.11 | 23.23 | 25.34 | 27.45 | 29.56 |
| 108                                | 18.00                     | 4.243                                    | 16.97                     | 19.09 | 21.21 | 23.34 | 25.46 | 27.58 | 29.70 |
| 109                                | 18.17                     | 4.262                                    | 17.05                     | 19.18 | 21.31 | 23.44 | 25.57 | 27.70 | 29.83 |
| 110                                | 18.33                     | 4.282                                    | 17.13                     | 19.27 | 21.41 | 23.55 | 25.69 | 27.83 | 29.97 |
| 111                                | 18.50                     | 4.301                                    | 17.20                     | 19.35 | 21.51 | 23.66 | 25.81 | 27.96 | 30.11 |
| 112                                | 18.67                     | 4.321                                    | 17.28                     | 19.44 | 21.60 | 23.77 | 25.93 | 28.09 | 30.25 |
| 113                                | 18.83                     | 4.340                                    | 17.36                     | 19.53 | 21.70 | 23.87 | 26.04 | 28.21 | 30.38 |
| 114                                | 19.00                     | 4.359                                    | 17.44                     | 19.62 | 21.79 | 23.97 | 26.15 | 28.33 | 30.51 |
| 115                                | 19.17                     | 4.378                                    | 17.51                     | 19.70 | 21.89 | 24.08 | 26.27 | 28.46 | 30.65 |
| 116                                | 19.33                     | 4.397                                    | 17.59                     | 19.79 | 21.98 | 24.18 | 26.38 | 28.58 | 30.78 |
| 117                                | 19.50                     | 4.416                                    | 17.66                     | 19.87 | 22.08 | 24.29 | 26.50 | 28.70 | 30.91 |
| 118                                | 19.67                     | 4.435                                    | 17.74                     | 19.96 | 22.17 | 24.39 | 26.61 | 28.83 | 31.04 |
| 119                                | 19.83                     | 4.454                                    | 17.82                     | 20.04 | 22.27 | 24.50 | 26.72 | 28.95 | 31.17 |
| 120                                | 20.00                     | 4.472                                    | 17.89                     | 20.12 | 22.36 | 24.60 | 26.83 | 29.07 | 31.30 |



# SIX PLY TWIST TABLE—(Continued)

| No. of<br>Yarn<br>to be<br>Twisted | No. of<br>Twisted<br>Yarn | Sq. Root<br>of No. of<br>Twisted<br>Yarn | TWIST PER INCH            |       |       |       |       |       |       |
|------------------------------------|---------------------------|--|---------------------------|-------|-------|-------|-------|-------|-------|
|                                    |                           |  | Square Root Multiplied by |       |       |       |       |       |       |
|                                    |                           |  | 4                         | 4½    | 5     | 5½    | 6     | 6½    | 7     |
| 121                                | 20.17                     | 4.491                                    | 17.96                     | 20.21 | 22.45 | 24.70 | 26.94 | 29.19 | 31.44 |
| 122                                | 20.33                     | 4.509                                    | 18.04                     | 20.29 | 22.55 | 24.80 | 27.05 | 29.31 | 31.56 |
| 123                                | 20.50                     | 4.528                                    | 18.11                     | 20.38 | 22.64 | 24.90 | 27.17 | 29.43 | 31.70 |
| 124                                | 20.67                     | 4.546                                    | 18.18                     | 20.46 | 22.73 | 25.00 | 27.28 | 29.55 | 31.82 |
| 125                                | 20.83                     | 4.564                                    | 18.26                     | 20.54 | 22.82 | 25.10 | 27.38 | 29.67 | 31.95 |
| 126                                | 21.00                     | 4.583                                    | 18.33                     | 20.62 | 22.91 | 25.21 | 27.50 | 29.79 | 32.08 |
| 127                                | 21.17                     | 4.601                                    | 18.40                     | 20.70 | 23.00 | 25.31 | 27.61 | 29.91 | 32.21 |
| 128                                | 21.33                     | 4.619                                    | 18.48                     | 20.79 | 23.09 | 25.40 | 27.71 | 30.02 | 32.33 |
| 129                                | 21.50                     | 4.637                                    | 18.55                     | 20.87 | 23.18 | 25.50 | 27.82 | 30.14 | 32.46 |
| 130                                | 21.67                     | 4.655                                    | 18.62                     | 20.95 | 23.27 | 25.60 | 27.93 | 30.26 | 32.59 |
| 131                                | 21.83                     | 4.673                                    | 18.69                     | 21.03 | 23.36 | 25.70 | 28.04 | 30.37 | 32.71 |
| 132                                | 22.00                     | 4.690                                    | 18.76                     | 21.11 | 23.45 | 25.80 | 28.14 | 30.49 | 32.83 |
| 133                                | 22.17                     | 4.708                                    | 18.83                     | 21.19 | 23.54 | 25.89 | 28.25 | 30.60 | 32.96 |
| 134                                | 22.33                     | 4.726                                    | 18.90                     | 21.27 | 23.63 | 25.99 | 28.36 | 30.72 | 33.08 |
| 135                                | 22.50                     | 4.743                                    | 18.97                     | 21.34 | 23.72 | 26.09 | 28.46 | 30.83 | 33.20 |
| 136                                | 22.67                     | 4.761                                    | 19.04                     | 21.42 | 23.80 | 26.19 | 28.57 | 30.95 | 33.33 |
| 137                                | 22.83                     | 4.778                                    | 19.11                     | 21.50 | 23.89 | 26.28 | 28.67 | 31.06 | 33.45 |
| 138                                | 23.00                     | 4.796                                    | 19.18                     | 21.58 | 23.98 | 26.38 | 28.78 | 31.17 | 33.57 |
| 139                                | 23.17                     | 4.813                                    | 19.25                     | 21.66 | 24.07 | 26.47 | 28.88 | 31.28 | 33.69 |
| 140                                | 23.33                     | 4.830                                    | 19.32                     | 21.74 | 24.15 | 26.57 | 28.98 | 31.40 | 33.81 |
| 141                                | 23.50                     | 4.848                                    | 19.39                     | 21.82 | 24.24 | 26.66 | 29.09 | 31.51 | 33.94 |
| 142                                | 23.67                     | 4.865                                    | 19.46                     | 21.89 | 24.32 | 26.76 | 29.19 | 31.62 | 34.06 |
| 143                                | 23.83                     | 4.882                                    | 19.53                     | 21.97 | 24.41 | 26.85 | 29.29 | 31.73 | 34.17 |
| 144                                | 24.00                     | 4.899                                    | 19.60                     | 22.05 | 24.49 | 26.94 | 29.39 | 31.84 | 34.29 |
| 145                                | 24.17                     | 4.916                                    | 19.66                     | 22.12 | 24.58 | 27.04 | 29.50 | 31.95 | 34.41 |
| 146                                | 24.33                     | 4.933                                    | 19.73                     | 22.20 | 24.66 | 27.13 | 29.60 | 32.06 | 34.53 |
| 147                                | 24.50                     | 4.950                                    | 19.80                     | 22.28 | 24.75 | 27.23 | 29.70 | 32.18 | 34.65 |
| 148                                | 24.67                     | 4.967                                    | 19.87                     | 22.35 | 24.83 | 27.32 | 29.80 | 32.29 | 34.77 |
| 149                                | 24.83                     | 4.983                                    | 19.93                     | 22.42 | 24.92 | 27.41 | 29.90 | 32.39 | 34.88 |
| 150                                | 25.00                     | 5.000                                    | 20.00                     | 22.50 | 25.00 | 27.50 | 30.00 | 32.50 | 35.00 |
| 151                                | 25.17                     | 5.017                                    | 20.07                     | 22.58 | 25.09 | 27.59 | 30.10 | 32.61 | 35.12 |
| 152                                | 25.33                     | 5.033                                    | 20.13                     | 22.65 | 25.17 | 27.68 | 30.20 | 32.71 | 35.23 |
| 153                                | 25.50                     | 5.050                                    | 20.20                     | 22.73 | 25.25 | 27.77 | 30.30 | 32.83 | 35.35 |
| 154                                | 25.67                     | 5.066                                    | 20.26                     | 22.80 | 25.33 | 27.86 | 30.40 | 32.93 | 35.46 |
| 155                                | 25.83                     | 5.083                                    | 20.33                     | 22.87 | 25.42 | 27.96 | 30.50 | 33.04 | 35.58 |
| 156                                | 26.00                     | 5.099                                    | 20.40                     | 22.95 | 25.50 | 28.04 | 30.59 | 33.14 | 35.69 |
| 157                                | 26.17                     | 5.115                                    | 20.46                     | 23.02 | 25.58 | 28.13 | 30.69 | 33.25 | 35.81 |
| 158                                | 26.33                     | 5.132                                    | 20.53                     | 23.09 | 25.66 | 28.23 | 30.79 | 33.36 | 35.92 |
| 159                                | 26.50                     | 5.148                                    | 20.59                     | 23.17 | 25.74 | 28.31 | 30.89 | 33.46 | 36.04 |
| 160                                | 26.67                     | 5.164                                    | 20.66                     | 23.24 | 25.82 | 28.40 | 30.98 | 33.57 | 36.15 |
| 161                                | 26.83                     | 5.180                                    | 20.72                     | 23.31 | 25.90 | 28.49 | 31.08 | 33.67 | 36.26 |
| 162                                | 27.00                     | 5.196                                    | 20.78                     | 23.38 | 25.98 | 28.58 | 31.18 | 33.77 | 36.37 |
| 163                                | 27.17                     | 5.212                                    | 20.85                     | 23.46 | 26.06 | 28.67 | 31.27 | 33.88 | 36.48 |
| 164                                | 27.33                     | 5.228                                    | 20.91                     | 23.53 | 26.14 | 28.75 | 31.37 | 33.98 | 36.60 |
| 165                                | 27.50                     | 5.244                                    | 20.98                     | 23.60 | 26.22 | 28.84 | 31.46 | 34.09 | 36.71 |
| 166                                | 27.67                     | 5.260                                    | 21.04                     | 23.67 | 26.30 | 28.93 | 31.56 | 34.19 | 36.82 |
| 167                                | 27.83                     | 5.276                                    | 21.10                     | 23.74 | 26.38 | 29.02 | 31.66 | 34.29 | 36.93 |
| 168                                | 28.00                     | 5.292                                    | 21.17                     | 23.81 | 26.46 | 29.11 | 31.75 | 34.40 | 37.04 |
| 169                                | 28.17                     | 5.307                                    | 21.23                     | 23.88 | 26.54 | 29.19 | 31.84 | 34.50 | 37.15 |
| 170                                | 28.33                     | 5.323                                    | 21.29                     | 23.95 | 26.62 | 29.28 | 31.94 | 34.60 | 37.26 |
| 171                                | 28.50                     | 5.339                                    | 21.36                     | 24.03 | 26.70 | 29.36 | 32.03 | 34.70 | 37.37 |
| 172                                | 28.67                     | 5.354                                    | 21.42                     | 24.09 | 26.77 | 29.45 | 32.12 | 34.80 | 37.48 |
| 173                                | 28.83                     | 5.370                                    | 21.48                     | 24.17 | 26.85 | 29.54 | 32.22 | 34.91 | 37.59 |
| 174                                | 29.00                     | 5.385                                    | 21.54                     | 24.23 | 26.93 | 29.62 | 32.31 | 35.00 | 37.70 |
| 175                                | 29.17                     | 5.401                                    | 21.60                     | 24.30 | 27.01 | 29.71 | 32.41 | 35.11 | 37.81 |
| 176                                | 29.33                     | 5.416                                    | 21.66                     | 24.37 | 27.08 | 29.79 | 32.50 | 35.20 | 37.91 |
| 177                                | 29.50                     | 5.431                                    | 21.72                     | 24.44 | 27.16 | 29.87 | 32.59 | 35.30 | 38.02 |
| 178                                | 29.67                     | 5.447                                    | 21.79                     | 24.51 | 27.24 | 29.96 | 32.68 | 35.41 | 38.13 |
| 179                                | 29.83                     | 5.462                                    | 21.85                     | 24.58 | 27.31 | 30.04 | 32.77 | 35.50 | 38.23 |
| 180                                | 30.00                     | 5.477                                    | 21.91                     | 24.65 | 27.39 | 30.12 | 32.86 | 35.60 | 38.34 |

## PRODUCTION TABLES

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On the following pages will be found our production tables for two, three, four, five and six ply yarns.

In preparing these tables our object has been to fully cover the ordinary range of ply yarns in a series of tables based on the various plies, each table being subdivided to conform to the general range and variation of the twist multipliers. The twist multipliers, with the resultant twists per inch for the various numbers of yarn and plies, may be found in the series of tables on the preceding pages, in which we have given a new and complete gradation from  $1\frac{1}{2}$  to 8 twist multiplier by halves.

Each complete production table — covering two opposite pages for each ply — gives the usual range of yarns and the general variation in the twist, and shows the gauge and size of ring for the various numbers of yarn. The length of traverse, size of bobbin and weight of yarn on bobbin may be found on the table of styles and dimensions of bobbins which follows the production tables. Thus the data contained in the production and bobbin tables forms the basis upon which we have calculated the production, our long experience and a careful consideration of actual conditions having shown such data to be a fair average.

It will of course be understood that our reference to actual conditions not only refers to the practical working conditions of the twisting machine itself, but also takes into consideration as far as possible the quality of the yarn and its use for specific purposes.

The front roll speeds, with the corresponding spindle speeds, have been decided upon after an extensive tabulation and careful study of data

obtained from many of the best mills of the country. We believe that these speeds are conservative, and that they represent a fair average of actual running conditions. The front roll speeds have been taken as a basis and the spindle speeds have been given only to the nearest hundred revolutions; thus the spindle speeds will be found correct if figured from the front roll speeds, but on the other hand the front roll speeds will not always appear correct if figured from the given spindle speeds. No allowance has been made for the contraction of ply yarns, since the actual contraction is extremely variable, depending as it does on whether the twist is with or opposite to the single yarn, whether first or second twist and whether the twist is soft or hard. Contraction as applied to the case in hand would mean, either that the spindle speeds would not be as much as given in the tables, or that the front roll speeds would exceed those given, since, on account of contraction, the actual twist per inch of the yarn would exceed the figured twist produced by a given front roll and spindle speed.

We have given the production for 58 hours per week only, since it would require an unnecessary elaboration of the tables to give also the production for 60 and 66 hours per week.

The production for 60 and 66 hours per week may be obtained with sufficient accuracy by adding to the given production 3 per cent for 60 hours and 13 per cent for 66 hours.

In estimating the production due allowance has been made for cleaning, oiling, doffing, ends down and stoppages. This allowance depending on the number of ply and the twist per inch, when carefully proportioned for the different numbers of yarn, is found to vary from 5 to 25 per cent.

# TWO PLY PRODUCTION TABLE

POUNDS PER SPINDLE PER WEEK OF 58 HOURS

| Number<br>of<br>Yarn | Gauge | Ring | MULTIPLIER 2                   |                         |                          | MULTIPLIER 3                   |                         |                          | MULTIPLIER 4                   |                         |                          |
|----------------------|-------|------|--------------------------------|-------------------------|--------------------------|--------------------------------|-------------------------|--------------------------|--------------------------------|-------------------------|--------------------------|
|                      |       |      | R.P.M.<br>of<br>1½ in.<br>Roll | R.P.M.<br>of<br>Spindle | Pounds<br>per<br>Spindle | R.P.M.<br>of<br>1½ in.<br>Roll | R.P.M.<br>of<br>Spindle | Pounds<br>per<br>Spindle | R.P.M.<br>of<br>1½ in.<br>Roll | R.P.M.<br>of<br>Spindle | Pounds<br>per<br>Spindle |
| 4                    | 4"    | 3"   | 187                            | 2500                    | 38.01                    | 175                            | 3500                    | 37.03                    | 142                            | 3800                    | 31.00                    |
| 5                    | "     | "    | 182                            | 2700                    | 30.99                    | 164                            | 3700                    | 29.00                    | 133                            | 4000                    | 24.09                    |
| 6                    | "     | "    | 178                            | 2900                    | 26.05                    | 155                            | 3800                    | 23.38                    | 125                            | 4100                    | 19.32                    |
| 7                    | "     | "    | 175                            | 3100                    | 22.36                    | 147                            | 3900                    | 19.28                    | 119                            | 4200                    | 15.95                    |
| 8                    | "     | "    | 172                            | 3300                    | 19.53                    | 141                            | 4000                    | 16.39                    | 114                            | 4300                    | 13.49                    |
| 9                    | 3½"   | 2½"  | 169                            | 3400                    | 17.26                    | 137                            | 4100                    | 14.30                    | 110                            | 4400                    | 11.66                    |
| 10                   | "     | "    | 166                            | 3500                    | 15.40                    | 133                            | 4200                    | 12.61                    | 107                            | 4500                    | 10.29                    |
| 11                   | "     | "    | 163                            | 3600                    | 13.87                    | 130                            | 4300                    | 11.28                    | 104                            | 4600                    | 9.16                     |
| 12                   | "     | "    | 160                            | 3700                    | 12.56                    | 127                            | 4400                    | 10.16                    | 102                            | 4700                    | 8.28                     |
| 13                   | "     | "    | 158                            | 3800                    | 11.52                    | 125                            | 4500                    | 9.27                     | 100                            | 4800                    | 7.53                     |
| 14                   | "     | "    | 156                            | 3900                    | 10.61                    | 123                            | 4600                    | 8.51                     | 98                             | 4900                    | 6.87                     |
| 15                   | "     | "    | 155                            | 4000                    | 9.87                     | 121                            | 4700                    | 7.84                     | 97                             | 5000                    | 6.37                     |
| 16                   | 3¼"   | 2¼"  | 154                            | 4100                    | 9.22                     | 120                            | 4800                    | 7.31                     | 96                             | 5100                    | 5.93                     |
| 17                   | "     | "    | 153                            | 4200                    | 8.64                     | 119                            | 4900                    | 6.84                     | 95                             | 5200                    | 5.53                     |
| 18                   | "     | "    | 152                            | 4300                    | 8.13                     | 118                            | 5000                    | 6.42                     | 94                             | 5300                    | 5.18                     |
| 19                   | "     | "    | 151                            | 4400                    | 7.66                     | 117                            | 5100                    | 6.04                     | 93                             | 5400                    | 4.86                     |
| 20                   | "     | "    | 150                            | 4500                    | 7.24                     | 116                            | 5200                    | 5.69                     | 92                             | 5500                    | 4.58                     |
| 22                   | "     | "    | 147                            | 4600                    | 6.46                     | 113                            | 5300                    | 5.05                     | 90                             | 5600                    | 4.08                     |
| 24                   | "     | "    | 144                            | 4700                    | 5.82                     | 110                            | 5400                    | 4.52                     | 88                             | 5700                    | 3.66                     |
| 26                   | 3"    | 2"   | 141                            | 4800                    | 5.27                     | 107                            | 5500                    | 4.07                     | 86                             | 5800                    | 3.31                     |
| 28                   | "     | "    | 139                            | 4900                    | 4.83                     | 105                            | 5600                    | 3.71                     | 84                             | 5900                    | 3.01                     |
| 30                   | "     | "    | 137                            | 5000                    | 4.46                     | 103                            | 5600                    | 3.41                     | 82                             | 6000                    | 2.74                     |
| 32                   | "     | "    | 135                            | 5100                    | 4.13                     | 101                            | 5700                    | 3.14                     | 80                             | 6000                    | 2.51                     |
| 34                   | "     | "    | 134                            | 5200                    | 3.86                     | 99                             | 5800                    | 2.90                     | 78                             | 6100                    | 2.31                     |
| 36                   | "     | "    | 133                            | 5300                    | 3.62                     | 97                             | 5800                    | 2.68                     | 76                             | 6100                    | 2.13                     |
| 38                   | "     | "    | 132                            | 5400                    | 3.41                     | 96                             | 5900                    | 2.52                     | 75                             | 6200                    | 1.99                     |
| 40                   | 2¾"   | 1¾"  | 131                            | 5500                    | 3.22                     | 95                             | 6000                    | 2.37                     | 74                             | 6200                    | 1.87                     |
| 42                   | "     | "    | 130                            | 5600                    | 3.05                     | 94                             | 6100                    | 2.24                     | 73                             | 6300                    | 1.76                     |
| 44                   | "     | "    | 129                            | 5700                    | 2.89                     | 93                             | 6200                    | 2.11                     | 72                             | 6400                    | 1.66                     |
| 46                   | "     | "    | 128                            | 5800                    | 2.75                     | 92                             | 6200                    | 2.00                     | 71                             | 6400                    | 1.56                     |
| 50                   | "     | "    | 126                            | 5900                    | 2.49                     | 90                             | 6300                    | 1.80                     | 69                             | 6500                    | 1.40                     |
| 55                   | "     | "    | 123                            | 6100                    | 2.21                     | 87                             | 6400                    | 1.59                     | 66                             | 6500                    | 1.22                     |
| 60                   | "     | "    | 120                            | 6200                    | 1.98                     | 84                             | 6500                    | 1.41                     | 64                             | 6600                    | 1.08                     |
| 65                   | 2¾"   | 1½"  | 117                            | 6300                    | 1.78                     | 82                             | 6600                    | 1.27                     | 62                             | 6700                    | .97                      |
| 70                   | "     | "    | 115                            | 6400                    | 1.63                     | 80                             | 6700                    | 1.16                     | 60                             | 6700                    | .87                      |
| 75                   | "     | "    | 113                            | 6500                    | 1.50                     | 78                             | 6700                    | 1.05                     | 58                             | 6700                    | .79                      |
| 80                   | "     | "    | 111                            | 6600                    | 1.38                     | 76                             | 6800                    | .96                      | 57                             | 6800                    | .73                      |
| 85                   | "     | "    |                                |                         |                          | 74                             | 6800                    | .88                      | 56                             | 6900                    | .67                      |
| 90                   | "     | "    |                                |                         |                          | 72                             | 6800                    | .81                      | 55                             | 7000                    | .62                      |
| 95                   | "     | "    |                                |                         |                          | 70                             | 6800                    | .75                      | 54                             | 7000                    | .58                      |
| 100                  | 2½"   | 1½"  |                                |                         |                          | 69                             | 6900                    | .70                      | 53                             | 7100                    | .54                      |
| 110                  | "     | "    |                                |                         |                          | 66                             | 6900                    | .61                      | 51                             | 7100                    | .47                      |
| 120                  | "     | "    |                                |                         |                          | 63                             | 6900                    | .53                      | 49                             | 7100                    | .42                      |
| 130                  | "     | "    |                                |                         |                          |                                |                         |                          | 47                             | 7100                    | .37                      |
| 140                  | "     | "    |                                |                         |                          |                                |                         |                          | 45                             | 7100                    | .33                      |
| 150                  | "     | "    |                                |                         |                          |                                |                         |                          | 44                             | 7200                    | .30                      |
| 160                  | "     | "    |                                |                         |                          |                                |                         |                          | 43                             | 7200                    | .28                      |

# TWO PLY PRODUCTION TABLE

(Continued)

POUNDS PER SPINDLE PER WEEK OF 58 HOURS

| Number<br>of<br>Yarn | Gauge | Ring | MULTIPLIER 5                   |                         |                          | MULTIPLIER 6                   |                         |                          | MULTIPLIER 7                   |                         |                          |
|----------------------|-------|------|--------------------------------|-------------------------|--------------------------|--------------------------------|-------------------------|--------------------------|--------------------------------|-------------------------|--------------------------|
|                      |       |      | R.P.M.<br>of<br>1½ in.<br>Roll | R.P.M.<br>of<br>Spindle | Pounds<br>per<br>Spindle | R.P.M.<br>of<br>1½ in.<br>Roll | R.P.M.<br>of<br>Spindle | Pounds<br>per<br>Spindle | R.P.M.<br>of<br>1½ in.<br>Roll | R.P.M.<br>of<br>Spindle | Pounds<br>per<br>Spindle |
| 4                    | 4"    | 3"   | 120                            | 4000                    | 26.84                    | 102                            | 4100                    | 23.23                    | 90                             | 4200                    | 20.87                    |
| 5                    | "     | "    | 111                            | 4100                    | 20.59                    | 94                             | 4200                    | 17.64                    | 82                             | 4300                    | 15.62                    |
| 6                    | "     | "    | 104                            | 4200                    | 16.37                    | 88                             | 4300                    | 14.05                    | 77                             | 4400                    | 12.46                    |
| 7                    | "     | "    | 98                             | 4300                    | 13.38                    | 83                             | 4400                    | 11.46                    | 73                             | 4500                    | 10.20                    |
| 8                    | "     | "    | 93                             | 4400                    | 11.21                    | 80                             | 4500                    | 9.73                     | 70                             | 4600                    | 8.61                     |
| 9                    | 3½"   | 2½"  | 90                             | 4500                    | 9.71                     | 77                             | 4600                    | 8.38                     | 67                             | 4700                    | 7.36                     |
| 10                   | "     | "    | 87                             | 4600                    | 8.49                     | 74                             | 4700                    | 7.27                     | 65                             | 4800                    | 6.44                     |
| 11                   | "     | "    | 85                             | 4700                    | 7.58                     | 72                             | 4800                    | 6.46                     | 63                             | 4900                    | 5.70                     |
| 12                   | "     | "    | 83                             | 4800                    | 6.80                     | 70                             | 4900                    | 5.78                     | 62                             | 5000                    | 5.15                     |
| 13                   | "     | "    | 81                             | 4900                    | 6.15                     | 69                             | 5000                    | 5.27                     | 61                             | 5100                    | 4.69                     |
| 14                   | "     | "    | 80                             | 5000                    | 5.66                     | 68                             | 5100                    | 4.84                     | 60                             | 5200                    | 4.29                     |
| 15                   | "     | "    | 79                             | 5100                    | 5.23                     | 67                             | 5200                    | 4.46                     | 59                             | 5300                    | 3.95                     |
| 16                   | 3¼"   | 2¼"  | 78                             | 5200                    | 4.85                     | 66                             | 5300                    | 4.13                     | 58                             | 5400                    | 3.64                     |
| 17                   | "     | "    | 77                             | 5300                    | 4.52                     | 65                             | 5400                    | 3.83                     | 57                             | 5500                    | 3.38                     |
| 18                   | "     | "    | 76                             | 5400                    | 4.22                     | 64                             | 5400                    | 3.57                     | 56                             | 5500                    | 3.13                     |
| 19                   | "     | "    | 75                             | 5400                    | 3.95                     | 63                             | 5500                    | 3.33                     | 55                             | 5600                    | 2.92                     |
| 20                   | "     | "    | 74                             | 5500                    | 3.70                     | 62                             | 5500                    | 3.12                     | 55                             | 5700                    | 2.77                     |
| 22                   | "     | "    | 72                             | 5600                    | 3.28                     | 61                             | 5700                    | 2.79                     | 54                             | 5900                    | 2.48                     |
| 24                   | "     | "    | 70                             | 5700                    | 2.93                     | 60                             | 5900                    | 2.52                     | 53                             | 6100                    | 2.23                     |
| 26                   | 3"    | 2"   | 68                             | 5800                    | 2.63                     | 59                             | 6000                    | 2.29                     | 52                             | 6200                    | 2.02                     |
| 28                   | "     | "    | 67                             | 5900                    | 2.41                     | 58                             | 6100                    | 2.09                     | 51                             | 6300                    | 1.85                     |
| 30                   | "     | "    | 66                             | 6000                    | 2.22                     | 57                             | 6200                    | 1.92                     | 50                             | 6400                    | 1.69                     |
| 32                   | "     | "    | 65                             | 6100                    | 2.05                     | 56                             | 6300                    | 1.77                     | 49                             | 6500                    | 1.55                     |
| 34                   | "     | "    | 64                             | 6200                    | 1.90                     | 55                             | 6400                    | 1.64                     | 48                             | 6500                    | 1.43                     |
| 36                   | "     | "    | 63                             | 6300                    | 1.77                     | 54                             | 6500                    | 1.52                     | 47                             | 6600                    | 1.33                     |
| 38                   | "     | "    | 62                             | 6400                    | 1.65                     | 53                             | 6500                    | 1.42                     | 46                             | 6600                    | 1.23                     |
| 40                   | 2¾"   | 1¾"  | 61                             | 6400                    | 1.55                     | 52                             | 6600                    | 1.32                     | 45                             | 6600                    | 1.15                     |
| 42                   | "     | "    | 60                             | 6500                    | 1.45                     | 51                             | 6600                    | 1.24                     | 44                             | 6700                    | 1.07                     |
| 44                   | "     | "    | 59                             | 6500                    | 1.36                     | 50                             | 6600                    | 1.16                     | 43                             | 6700                    | 1.00                     |
| 46                   | "     | "    | 58                             | 6600                    | 1.28                     | 49                             | 6600                    | 1.09                     | 42                             | 6700                    | .93                      |
| 50                   | "     | "    | 56                             | 6600                    | 1.14                     | 47                             | 6600                    | .96                      | 41                             | 6800                    | .84                      |
| 55                   | "     | "    | 54                             | 6700                    | .98                      | 46                             | 6800                    | .85                      | 40                             | 6900                    | .74                      |
| 60                   | "     | "    | 52                             | 6700                    | .88                      | 45                             | 7000                    | .77                      | 39                             | 7000                    | .67                      |
| 65                   | 2½"   | 1½"  | 50                             | 6700                    | .79                      | 44                             | 7100                    | .69                      | 38                             | 7100                    | .60                      |
| 70                   | "     | "    | 49                             | 6800                    | .72                      | 43                             | 7200                    | .63                      | 37                             | 7200                    | .54                      |
| 75                   | "     | "    | 48                             | 6900                    | .65                      | 42                             | 7300                    | .57                      | 36                             | 7300                    | .49                      |
| 80                   | "     | "    | 47                             | 7000                    | .60                      | 41                             | 7300                    | .53                      | 35                             | 7400                    | .45                      |
| 85                   | "     | "    | 46                             | 7100                    | .55                      | 40                             | 7400                    | .48                      | 35                             | 7500                    | .42                      |
| 90                   | "     | "    | 45                             | 7100                    | .51                      | 39                             | 7400                    | .45                      | 34                             | 7500                    | .39                      |
| 95                   | "     | "    | 44                             | 7100                    | .47                      | 38                             | 7400                    | .41                      | 33                             | 7500                    | .36                      |
| 100                  | 2½"   | 1½"  | 43                             | 7200                    | .44                      | 37                             | 7400                    | .38                      | 32                             | 7500                    | .33                      |
| 110                  | "     | "    | 41                             | 7200                    | .38                      | 35                             | 7400                    | .33                      | 30                             | 7500                    | .28                      |
| 120                  | "     | "    | 39                             | 7200                    | .33                      | 34                             | 7400                    | .29                      | 29                             | 7500                    | .25                      |
| 130                  | "     | "    | 38                             | 7200                    | .30                      |                                |                         |                          |                                |                         |                          |
| 140                  | "     | "    | 37                             | 7300                    | .27                      |                                |                         |                          |                                |                         |                          |
| 150                  | "     | "    | 36                             | 7300                    | .25                      |                                |                         |                          |                                |                         |                          |
| 160                  | "     | "    | 35                             | 7400                    | .22                      |                                |                         |                          |                                |                         |                          |



# THREE PLY PRODUCTION TABLE

POUNDS PER SPINDLE PER WEEK OF 58 HOURS

| Number<br>of<br>Yarn | Gauge | Ring | MULTIPLIER 2                   |                         |                          | MULTIPLIER 3                   |                         |                          | MULTIPLIER 4                   |                         |                          |
|----------------------|-------|------|--------------------------------|-------------------------|--------------------------|--------------------------------|-------------------------|--------------------------|--------------------------------|-------------------------|--------------------------|
|                      |       |      | R.P.M.<br>of<br>1½ in.<br>Roll | R.P.M.<br>of<br>Spindle | Pounds<br>per<br>Spindle | R.P.M.<br>of<br>1½ in.<br>Roll | R.P.M.<br>of<br>Spindle | Pounds<br>per<br>Spindle | R.P.M.<br>of<br>1½ in.<br>Roll | R.P.M.<br>of<br>Spindle | Pounds<br>per<br>Spindle |
| 4                    | 4½"   | 3½"  | 184                            | 2000                    | 56.12                    | 171                            | 2800                    | 54.25                    | 147                            | 3200                    | 48.14                    |
| 5                    | "     | "    | 180                            | 2200                    | 45.98                    | 163                            | 3000                    | 43.23                    | 138                            | 3400                    | 37.36                    |
| 6                    | "     | "    | 177                            | 2400                    | 38.64                    | 157                            | 3100                    | 35.54                    | 131                            | 3500                    | 30.26                    |
| 7                    | "     | "    | 174                            | 2500                    | 33.16                    | 151                            | 3300                    | 29.65                    | 125                            | 3600                    | 25.04                    |
| 8                    | "     | "    | 172                            | 2700                    | 29.03                    | 147                            | 3400                    | 25.50                    | 121                            | 3700                    | 21.41                    |
| 9                    | 4"    | 3"   | 170                            | 2800                    | 25.72                    | 143                            | 3500                    | 22.21                    | 117                            | 3800                    | 18.53                    |
| 10                   | "     | "    | 168                            | 2900                    | 23.04                    | 140                            | 3600                    | 19.68                    | 114                            | 3900                    | 16.34                    |
| 11                   | "     | "    | 167                            | 3000                    | 20.95                    | 137                            | 3700                    | 17.59                    | 111                            | 4000                    | 14.53                    |
| 12                   | "     | "    | 166                            | 3100                    | 19.17                    | 135                            | 3800                    | 15.96                    | 109                            | 4100                    | 13.12                    |
| 13                   | "     | "    | 165                            | 3200                    | 17.68                    | 133                            | 3900                    | 14.56                    | 107                            | 4200                    | 11.93                    |
| 14                   | "     | "    | 164                            | 3300                    | 16.39                    | 131                            | 4000                    | 13.36                    | 106                            | 4300                    | 11.01                    |
| 15                   | 3½"   | 2½"  | 163                            | 3400                    | 15.26                    | 130                            | 4100                    | 12.42                    | 105                            | 4400                    | 10.21                    |
| 16                   | "     | "    | 162                            | 3500                    | 14.26                    | 129                            | 4200                    | 11.60                    | 104                            | 4500                    | 9.52                     |
| 17                   | "     | "    | 161                            | 3600                    | 13.39                    | 128                            | 4300                    | 10.86                    | 103                            | 4600                    | 8.89                     |
| 18                   | "     | "    | 160                            | 3700                    | 12.61                    | 127                            | 4400                    | 10.22                    | 102                            | 4700                    | 8.33                     |
| 19                   | "     | "    | 159                            | 3800                    | 11.91                    | 126                            | 4500                    | 9.64                     | 101                            | 4800                    | 7.83                     |
| 20                   | "     | "    | 158                            | 3800                    | 11.28                    | 125                            | 4600                    | 9.10                     | 100                            | 4900                    | 7.39                     |
| 22                   | "     | "    | 156                            | 4000                    | 10.16                    | 122                            | 4700                    | 8.09                     | 98                             | 5000                    | 6.59                     |
| 24                   | 3¼"   | 2¼"  | 154                            | 4100                    | 9.23                     | 120                            | 4800                    | 7.32                     | 96                             | 5100                    | 5.94                     |
| 26                   | "     | "    | 152                            | 4200                    | 8.43                     | 118                            | 4900                    | 6.63                     | 94                             | 5200                    | 5.38                     |
| 28                   | "     | "    | 150                            | 4300                    | 7.74                     | 116                            | 5000                    | 6.09                     | 92                             | 5300                    | 4.90                     |
| 30                   | "     | "    | 148                            | 4400                    | 7.14                     | 114                            | 5100                    | 5.60                     | 90                             | 5400                    | 4.48                     |
| 32                   | "     | "    | 146                            | 4500                    | 6.62                     | 112                            | 5200                    | 5.16                     | 88                             | 5400                    | 4.11                     |
| 34                   | "     | "    | 145                            | 4600                    | 6.20                     | 110                            | 5200                    | 4.78                     | 87                             | 5500                    | 3.83                     |
| 36                   | "     | "    | 144                            | 4700                    | 5.83                     | 108                            | 5300                    | 4.45                     | 86                             | 5600                    | 3.58                     |
| 38                   | 3"    | 2"   | 143                            | 4800                    | 5.50                     | 107                            | 5400                    | 4.18                     | 85                             | 5700                    | 3.35                     |
| 40                   | "     | "    | 142                            | 4900                    | 5.19                     | 106                            | 5500                    | 3.94                     | 84                             | 5800                    | 3.15                     |
| 42                   | "     | "    | 141                            | 5000                    | 4.92                     | 105                            | 5600                    | 3.72                     | 83                             | 5900                    | 2.97                     |
| 44                   | "     | "    | 140                            | 5100                    | 4.66                     | 104                            | 5600                    | 3.52                     | 82                             | 5900                    | 2.81                     |
| 46                   | "     | "    | 139                            | 5100                    | 4.43                     | 103                            | 5700                    | 3.34                     | 81                             | 6000                    | 2.65                     |
| 50                   | "     | "    | 137                            | 5300                    | 4.03                     | 101                            | 5800                    | 3.02                     | 79                             | 6100                    | 2.38                     |
| 55                   | "     | "    | 134                            | 5400                    | 3.59                     | 98                             | 5900                    | 2.67                     | 76                             | 6100                    | 2.09                     |
| 60                   | 2¾"   | 1¾"  |                                |                         |                          | 95                             | 6000                    | 2.38                     | 74                             | 6200                    | 1.87                     |
| 65                   | "     | "    |                                |                         |                          | 92                             | 6100                    | 2.13                     | 72                             | 6300                    | 1.68                     |
| 70                   | "     | "    |                                |                         |                          | 90                             | 6100                    | 1.93                     | 70                             | 6400                    | 1.52                     |
| 75                   | "     | "    |                                |                         |                          | 88                             | 6200                    | 1.77                     | 68                             | 6400                    | 1.38                     |
| 80                   | "     | "    |                                |                         |                          | 86                             | 6300                    | 1.62                     | 66                             | 6400                    | 1.26                     |
| 85                   | "     | "    |                                |                         |                          | 84                             | 6300                    | 1.49                     | 65                             | 6500                    | 1.16                     |
| 90                   | 2¾"   | 1¾"  |                                |                         |                          |                                |                         |                          | 64                             | 6600                    | 1.08                     |
| 59                   | "     | "    |                                |                         |                          |                                |                         |                          | 63                             | 6700                    | 1.01                     |
| 100                  | "     | "    |                                |                         |                          |                                |                         |                          | 62                             | 6700                    | .95                      |
| 110                  | "     | "    |                                |                         |                          |                                |                         |                          | 60                             | 6800                    | .83                      |
| 120                  | "     | "    |                                |                         |                          |                                |                         |                          | 58                             | 6900                    | .74                      |



# THREE PLY PRODUCTION TABLE

(Continued)

POUNDS PER SPINDLE PER WEEK OF 58 HOURS

| Number<br>of<br>Yarn | Gauge | Ring | MULTIPLIER 5                   |                         |                          | MULTIPLIER 6                   |                         |                          | MULTIPLIER 7                   |                         |                          |
|----------------------|-------|------|--------------------------------|-------------------------|--------------------------|--------------------------------|-------------------------|--------------------------|--------------------------------|-------------------------|--------------------------|
|                      |       |      | R.P.M.<br>of<br>1½ in.<br>Roll | R.P.M.<br>of<br>Spindle | Pounds<br>per<br>Spindle | R.P.M.<br>of<br>1½ in.<br>Roll | R.P.M.<br>of<br>Spindle | Pounds<br>per<br>Spindle | R.P.M.<br>of<br>1½ in.<br>Roll | R.P.M.<br>of<br>Spindle | Pounds<br>per<br>Spindle |
| 4                    | 1½"   | 3½"  | 121                            | 3300                    | 40.36                    | 104                            | 3400                    | 35.32                    | 92                             | 3500                    | 31.81                    |
| 5                    | "     | "    | 114                            | 3500                    | 31.53                    | 98                             | 3600                    | 27.49                    | 86                             | 3700                    | 24.48                    |
| 6                    | "     | "    | 108                            | 3600                    | 25.42                    | 93                             | 3700                    | 22.22                    | 81                             | 3800                    | 19.61                    |
| 7                    | "     | "    | 103                            | 3700                    | 20.95                    | 88                             | 3800                    | 18.14                    | 78                             | 3900                    | 16.28                    |
| 8                    | "     | "    | 99                             | 3800                    | 17.74                    | 85                             | 3900                    | 15.42                    | 75                             | 4000                    | 13.76                    |
| 9                    | 4"    | 3"   | 96                             | 3900                    | 15.39                    | 82                             | 4000                    | 13.29                    | 72                             | 4100                    | 11.78                    |
| 10                   | "     | "    | 93                             | 4000                    | 13.49                    | 80                             | 4100                    | 11.73                    | 70                             | 4200                    | 10.34                    |
| 11                   | "     | "    | 91                             | 4100                    | 12.05                    | 78                             | 4200                    | 10.43                    | 68                             | 4300                    | 9.15                     |
| 12                   | "     | "    | 89                             | 4200                    | 10.84                    | 76                             | 4300                    | 9.33                     | 67                             | 4400                    | 8.28                     |
| 13                   | "     | "    | 88                             | 4300                    | 9.92                     | 75                             | 4400                    | 8.52                     | 66                             | 4500                    | 7.55                     |
| 14                   | "     | "    | 87                             | 4400                    | 9.13                     | 74                             | 4500                    | 7.83                     | 65                             | 4600                    | 6.92                     |
| 15                   | 3½"   | 2½"  | 86                             | 4500                    | 8.44                     | 73                             | 4600                    | 7.21                     | 64                             | 4700                    | 6.37                     |
| 16                   | "     | "    | 85                             | 4600                    | 7.84                     | 72                             | 4700                    | 6.69                     | 63                             | 4800                    | 5.89                     |
| 17                   | "     | "    | 84                             | 4700                    | 7.31                     | 71                             | 4800                    | 6.22                     | 62                             | 4900                    | 5.47                     |
| 18                   | "     | "    | 83                             | 4800                    | 6.83                     | 70                             | 4800                    | 5.80                     | 61                             | 4900                    | 5.08                     |
| 19                   | "     | "    | 82                             | 4900                    | 6.41                     | 69                             | 4900                    | 5.43                     | 60                             | 5000                    | 4.74                     |
| 20                   | "     | "    | 81                             | 4900                    | 6.03                     | 68                             | 5000                    | 5.09                     | 60                             | 5100                    | 4.51                     |
| 22                   | "     | "    | 79                             | 5000                    | 5.36                     | 67                             | 5100                    | 4.57                     | 59                             | 5300                    | 4.04                     |
| 24                   | 3¼"   | 2¼"  | 77                             | 5100                    | 4.80                     | 66                             | 5300                    | 4.13                     | 58                             | 5400                    | 3.64                     |
| 26                   | "     | "    | 76                             | 5300                    | 4.38                     | 65                             | 5400                    | 3.76                     | 57                             | 5500                    | 3.31                     |
| 28                   | "     | "    | 75                             | 5400                    | 4.02                     | 64                             | 5500                    | 3.44                     | 56                             | 5600                    | 3.02                     |
| 30                   | "     | "    | 74                             | 5500                    | 3.70                     | 63                             | 5600                    | 3.17                     | 55                             | 5700                    | 2.77                     |
| 32                   | "     | "    | 73                             | 5600                    | 3.43                     | 62                             | 5700                    | 2.93                     | 54                             | 5800                    | 2.56                     |
| 34                   | "     | "    | 72                             | 5700                    | 3.19                     | 61                             | 5800                    | 2.71                     | 53                             | 5900                    | 2.36                     |
| 36                   | "     | "    | 71                             | 5800                    | 2.97                     | 60                             | 5900                    | 2.52                     | 52                             | 5900                    | 2.19                     |
| 38                   | 3"    | 2"   | 70                             | 5900                    | 2.79                     | 59                             | 5900                    | 2.35                     | 51                             | 6000                    | 2.04                     |
| 40                   | "     | "    | 69                             | 5900                    | 2.61                     | 58                             | 6000                    | 2.20                     | 50                             | 6000                    | 1.90                     |
| 42                   | "     | "    | 68                             | 6000                    | 2.45                     | 57                             | 6000                    | 2.06                     | 49                             | 6100                    | 1.78                     |
| 44                   | "     | "    | 67                             | 6000                    | 2.30                     | 56                             | 6100                    | 1.93                     | 48                             | 6100                    | 1.66                     |
| 46                   | "     | "    | 66                             | 6100                    | 2.17                     | 55                             | 6100                    | 1.82                     | 48                             | 6200                    | 1.59                     |
| 50                   | "     | "    | 64                             | 6100                    | 1.94                     | 54                             | 6200                    | 1.64                     | 47                             | 6300                    | 1.43                     |
| 55                   | "     | "    | 62                             | 6200                    | 1.71                     | 52                             | 6300                    | 1.44                     | 46                             | 6500                    | 1.28                     |
| 60                   | 2¾"   | 1¾"  | 60                             | 6300                    | 1.52                     | 51                             | 6400                    | 1.30                     | 45                             | 6600                    | 1.15                     |
| 65                   | "     | "    | 58                             | 6400                    | 1.36                     | 50                             | 6600                    | 1.18                     | 44                             | 6700                    | 1.04                     |
| 70                   | "     | "    | 57                             | 6500                    | 1.24                     | 49                             | 6700                    | 1.07                     | 43                             | 6800                    | .94                      |
| 75                   | "     | "    | 56                             | 6600                    | 1.14                     | 48                             | 6800                    | .98                      | 42                             | 6900                    | .86                      |
| 80                   | "     | "    | 55                             | 6700                    | 1.05                     | 47                             | 6900                    | .90                      | 41                             | 7000                    | .79                      |
| 85                   | "     | "    | 54                             | 6800                    | .97                      | 46                             | 6900                    | .83                      | 40                             | 7000                    | .72                      |
| 90                   | 2¾"   | 1¾"  | 53                             | 6800                    | .90                      | 45                             | 7000                    | .77                      | 39                             | 7000                    | .67                      |
| 95                   | "     | "    | 52                             | 6900                    | .84                      | 44                             | 7000                    | .71                      | 38                             | 7000                    | .62                      |
| 100                  | "     | "    | 51                             | 6900                    | .78                      | 43                             | 7000                    | .66                      | 37                             | 7000                    | .57                      |
| 110                  | "     | "    | 49                             | 7000                    | .68                      | 41                             | 7000                    | .57                      | 35                             | 7000                    | .49                      |
| 120                  | "     | "    | 47                             | 7000                    | .60                      | 39                             | 7000                    | .50                      | 34                             | 7000                    | .44                      |

# FOUR PLY PRODUCTION TABLE

POUNDS PER SPINDLE PER WEEK OF 58 HOURS

| Number<br>of<br>Yarn | Gauge | Ring | MULTIPLIER 2                   |                         |                          | MULTIPLIER 3                   |                         |                          | MULTIPLIER 4                   |                         |                          |
|----------------------|-------|------|--------------------------------|-------------------------|--------------------------|--------------------------------|-------------------------|--------------------------|--------------------------------|-------------------------|--------------------------|
|                      |       |      | R.P.M.<br>of<br>1½ in.<br>Roll | R.P.M.<br>of<br>Spindle | Pounds<br>per<br>Spindle | R.P.M.<br>of<br>1½ in.<br>Roll | R.P.M.<br>of<br>Spindle | Pounds<br>per<br>Spindle | R.P.M.<br>of<br>1½ in.<br>Roll | R.P.M.<br>of<br>Spindle | Pounds<br>per<br>Spindle |
| 4                    | 5"    | 4"   | 181                            | 1700                    | 73.61                    | 177                            | 2500                    | 73.41                    | 144                            | 2700                    | 62.87                    |
| 5                    | "     | "    | 178                            | 1900                    | 60.62                    | 171                            | 2700                    | 59.34                    | 136                            | 2900                    | 48.97                    |
| 6                    | "     | "    | 176                            | 2000                    | 51.22                    | 166                            | 2900                    | 49.33                    | 129                            | 3000                    | 39.40                    |
| 7                    | "     | "    | 174                            | 2200                    | 44.21                    | 161                            | 3000                    | 41.80                    | 124                            | 3100                    | 32.96                    |
| 8                    | 4½"   | 3½"  | 172                            | 2300                    | 38.70                    | 156                            | 3100                    | 35.87                    | 120                            | 3200                    | 28.17                    |
| 9                    | "     | "    | 171                            | 2400                    | 34.49                    | 152                            | 3200                    | 31.32                    | 117                            | 3300                    | 24.59                    |
| 10                   | "     | "    | 170                            | 2500                    | 31.08                    | 148                            | 3300                    | 27.61                    | 115                            | 3400                    | 21.85                    |
| 11                   | "     | "    | 169                            | 2600                    | 28.26                    | 145                            | 3400                    | 24.70                    | 113                            | 3500                    | 19.58                    |
| 12                   | "     | "    | 168                            | 2700                    | 25.87                    | 142                            | 3500                    | 22.25                    | 111                            | 3600                    | 17.67                    |
| 13                   | 4"    | 3"   | 167                            | 2800                    | 23.82                    | 140                            | 3600                    | 20.30                    | 110                            | 3700                    | 16.20                    |
| 14                   | "     | "    | 166                            | 2900                    | 22.06                    | 138                            | 3600                    | 18.62                    | 109                            | 3800                    | 14.94                    |
| 15                   | "     | "    | 165                            | 3000                    | 20.52                    | 136                            | 3700                    | 17.16                    | 108                            | 3900                    | 13.85                    |
| 16                   | "     | "    | 164                            | 3100                    | 19.16                    | 134                            | 3800                    | 15.89                    | 107                            | 4000                    | 12.89                    |
| 17                   | "     | "    | 163                            | 3200                    | 17.96                    | 133                            | 3900                    | 14.88                    | 106                            | 4100                    | 12.05                    |
| 18                   | "     | "    | 162                            | 3200                    | 16.88                    | 132                            | 4000                    | 13.98                    | 105                            | 4200                    | 11.30                    |
| 19                   | "     | "    | 161                            | 3300                    | 15.93                    | 131                            | 4000                    | 13.17                    | 104                            | 4300                    | 10.61                    |
| 20                   | 3½"   | 2½"  | 160                            | 3400                    | 15.06                    | 130                            | 4100                    | 12.43                    | 103                            | 4300                    | 9.99                     |
| 22                   | "     | "    | 158                            | 3500                    | 13.56                    | 127                            | 4200                    | 11.08                    | 101                            | 4500                    | 8.94                     |
| 24                   | "     | "    | 156                            | 3600                    | 12.32                    | 125                            | 4300                    | 10.03                    | 99                             | 4600                    | 8.04                     |
| 26                   | "     | "    | 155                            | 3700                    | 11.34                    | 123                            | 4400                    | 9.14                     | 97                             | 4700                    | 7.31                     |
| 28                   | "     | "    | 154                            | 3800                    | 10.49                    | 121                            | 4500                    | 8.38                     | 96                             | 4800                    | 6.74                     |
| 30                   | "     | "    | 153                            | 3900                    | 9.75                     | 119                            | 4600                    | 7.71                     | 95                             | 4900                    | 6.24                     |
| 32                   | "     | "    | 152                            | 4000                    | 9.10                     | 117                            | 4700                    | 7.13                     | 94                             | 5000                    | 5.80                     |
| 34                   | 3¼"   | 2¼"  | 151                            | 4100                    | 8.53                     | 116                            | 4800                    | 6.67                     | 93                             | 5100                    | 5.41                     |
| 36                   | "     | "    | 150                            | 4200                    | 8.02                     | 115                            | 4900                    | 6.26                     | 92                             | 5200                    | 5.06                     |
| 38                   | "     | "    | 149                            | 4300                    | 7.56                     | 114                            | 5000                    | 5.88                     | 91                             | 5300                    | 4.75                     |
| 40                   | "     | "    | 148                            | 4400                    | 7.14                     | 113                            | 5100                    | 5.55                     | 90                             | 5400                    | 4.47                     |
| 42                   | "     | "    | 147                            | 4500                    | 6.76                     | 112                            | 5100                    | 5.24                     | 89                             | 5400                    | 4.21                     |
| 44                   | "     | "    | 146                            | 4600                    | 6.42                     | 111                            | 5200                    | 4.96                     | 88                             | 5500                    | 3.98                     |
| 46                   | "     | "    | 145                            | 4600                    | 6.19                     | 110                            | 5300                    | 4.71                     | 87                             | 5600                    | 3.77                     |
| 50                   | 3"    | 2"   |                                |                         |                          | 108                            | 5400                    | 4.26                     | 85                             | 5700                    | 3.39                     |
| 55                   | "     | "    |                                |                         |                          | 105                            | 5500                    | 3.78                     | 83                             | 5800                    | 3.02                     |
| 60                   | "     | "    |                                |                         |                          | 102                            | 5600                    | 3.37                     | 81                             | 5900                    | 2.70                     |
| 65                   | "     | "    |                                |                         |                          | 100                            | 5700                    | 3.05                     | 79                             | 6000                    | 2.44                     |
| 70                   | "     | "    |                                |                         |                          | 98                             | 5800                    | 2.78                     | 77                             | 6100                    | 2.21                     |
| 75                   | "     | "    |                                |                         |                          | 96                             | 5900                    | 2.54                     | 75                             | 6100                    | 2.01                     |
| 80                   | 2¾"   | 1¾"  |                                |                         |                          |                                |                         |                          | 73                             | 6200                    | 1.84                     |
| 85                   | "     | "    |                                |                         |                          |                                |                         |                          | 71                             | 6200                    | 1.68                     |
| 90                   | "     | "    |                                |                         |                          |                                |                         |                          | 70                             | 6300                    | 1.57                     |
| 95                   | "     | "    |                                |                         |                          |                                |                         |                          | 69                             | 6300                    | 1.47                     |
| 100                  | "     | "    |                                |                         |                          |                                |                         |                          | 68                             | 6400                    | 1.37                     |

# PRODUCTION TABLE FOR TWISTING

## FOUR PLY PRODUCTION TABLE

(Continued)

### POUNDS PER SPINDLE PER WEEK OF 58 HOURS

| Number<br>of<br>Yarn | Gauge | Ring | MULTIPLIER 5                   |                         |                          | MULTIPLIER 6                   |                         |                          | MULTIPLIER 7                   |                         |                          |
|----------------------|-------|------|--------------------------------|-------------------------|--------------------------|--------------------------------|-------------------------|--------------------------|--------------------------------|-------------------------|--------------------------|
|                      |       |      | R.P.M.<br>of<br>1½ in.<br>Roll | R.P.M.<br>of<br>Spindle | Pounds<br>per<br>Spindle | R.P.M.<br>of<br>1½ in.<br>Roll | R.P.M.<br>of<br>Spindle | Pounds<br>per<br>Spindle | R.P.M.<br>of<br>1½ in.<br>Roll | R.P.M.<br>of<br>Spindle | Pounds<br>per<br>Spindle |
| 4                    | 5"    | 4"   | 119                            | 2800                    | 52.91                    | 103                            | 2900                    | 46.63                    | 88                             | 2900                    | 40.57                    |
| 5                    | "     | "    | 113                            | 3000                    | 41.57                    | 97                             | 3100                    | 36.28                    | 84                             | 3100                    | 31.89                    |
| 6                    | "     | "    | 108                            | 3100                    | 33.77                    | 92                             | 3200                    | 29.16                    | 80                             | 3200                    | 25.49                    |
| 7                    | "     | "    | 104                            | 3200                    | 28.16                    | 89                             | 3300                    | 24.40                    | 77                             | 3400                    | 21.38                    |
| 8                    | 4½"   | 3½"  | 101                            | 3400                    | 24.12                    | 87                             | 3500                    | 21.02                    | 75                             | 3500                    | 18.35                    |
| 9                    | "     | "    | 99                             | 3500                    | 21.14                    | 85                             | 3600                    | 18.36                    | 73                             | 3600                    | 15.76                    |
| 10                   | "     | "    | 97                             | 3600                    | 18.72                    | 83                             | 3700                    | 16.20                    | 71                             | 3700                    | 14.00                    |
| 11                   | "     | "    | 95                             | 3700                    | 16.73                    | 81                             | 3800                    | 14.42                    | 69                             | 3800                    | 12.39                    |
| 12                   | "     | "    | 94                             | 3800                    | 15.20                    | 80                             | 3900                    | 13.09                    | 68                             | 3900                    | 11.22                    |
| 13                   | 4"    | 3"   | 93                             | 3900                    | 13.91                    | 79                             | 4000                    | 11.96                    | 67                             | 4000                    | 10.22                    |
| 14                   | "     | "    | 92                             | 4000                    | 12.81                    | 78                             | 4100                    | 10.97                    | 66                             | 4100                    | 9.36                     |
| 15                   | "     | "    | 91                             | 4100                    | 11.84                    | 77                             | 4200                    | 10.12                    | 66                             | 4200                    | 8.74                     |
| 16                   | "     | "    | 90                             | 4200                    | 10.99                    | 76                             | 4300                    | 9.38                     | 65                             | 4300                    | 8.08                     |
| 17                   | "     | "    | 89                             | 4300                    | 10.24                    | 75                             | 4400                    | 8.71                     | 65                             | 4400                    | 7.61                     |
| 18                   | "     | "    | 88                             | 4400                    | 9.58                     | 74                             | 4400                    | 8.13                     | 64                             | 4500                    | 7.09                     |
| 19                   | "     | "    | 87                             | 4500                    | 8.98                     | 73                             | 4500                    | 7.61                     | 64                             | 4600                    | 6.72                     |
| 20                   | 3½"   | 2½"  | 86                             | 4500                    | 8.44                     | 73                             | 4600                    | 7.24                     | 63                             | 4700                    | 6.29                     |
| 22                   | "     | "    | 84                             | 4600                    | 7.51                     | 72                             | 4800                    | 6.50                     | 62                             | 4800                    | 5.64                     |
| 24                   | "     | "    | 82                             | 4700                    | 6.73                     | 71                             | 4900                    | 5.89                     | 61                             | 4900                    | 5.09                     |
| 26                   | "     | "    | 81                             | 4900                    | 6.15                     | 70                             | 5000                    | 5.37                     | 60                             | 5000                    | 4.63                     |
| 28                   | "     | "    | 80                             | 5000                    | 5.65                     | 69                             | 5100                    | 4.93                     | 59                             | 5100                    | 4.23                     |
| 30                   | "     | "    | 79                             | 5100                    | 5.22                     | 67                             | 5200                    | 4.48                     | 58                             | 5200                    | 3.88                     |
| 32                   | "     | "    | 78                             | 5200                    | 4.84                     | 66                             | 5300                    | 4.14                     | 57                             | 5300                    | 3.59                     |
| 34                   | 3¼"   | 2¼"  | 77                             | 5300                    | 4.51                     | 65                             | 5400                    | 3.84                     | 56                             | 5400                    | 3.32                     |
| 36                   | "     | "    | 76                             | 5400                    | 4.21                     | 64                             | 5400                    | 3.57                     | 55                             | 5500                    | 3.08                     |
| 38                   | "     | "    | 75                             | 5400                    | 3.94                     | 63                             | 5500                    | 3.34                     | 55                             | 5600                    | 2.92                     |
| 40                   | "     | "    | 74                             | 5500                    | 3.70                     | 62                             | 5500                    | 3.12                     | 54                             | 5600                    | 2.73                     |
| 42                   | "     | "    | 73                             | 5600                    | 3.48                     | 61                             | 5600                    | 2.93                     | 53                             | 5700                    | 2.55                     |
| 44                   | "     | "    | 72                             | 5600                    | 3.28                     | 60                             | 5600                    | 2.75                     | 53                             | 5700                    | 2.44                     |
| 46                   | "     | "    | 71                             | 5700                    | 3.10                     | 59                             | 5700                    | 2.59                     | 52                             | 5800                    | 2.29                     |
| 50                   | 3"    | 2"   | 69                             | 5800                    | 2.78                     | 58                             | 5800                    | 2.34                     | 52                             | 5900                    | 2.11                     |
| 55                   | "     | "    | 67                             | 5900                    | 2.46                     | 56                             | 5900                    | 2.06                     | 50                             | 6100                    | 1.84                     |
| 60                   | "     | "    | 65                             | 5900                    | 2.19                     | 55                             | 6000                    | 1.86                     | 49                             | 6300                    | 1.66                     |
| 65                   | "     | "    | 63                             | 6000                    | 1.96                     | 54                             | 6200                    | 1.68                     | 48                             | 6400                    | 1.50                     |
| 70                   | "     | "    | 62                             | 6100                    | 1.79                     | 53                             | 6300                    | 1.53                     | 47                             | 6500                    | 1.37                     |
| 75                   | "     | "    | 61                             | 6200                    | 1.65                     | 52                             | 6400                    | 1.41                     | 46                             | 6600                    | 1.25                     |
| 80                   | 2¾"   | 1¾"  | 60                             | 6300                    | 1.52                     | 51                             | 6400                    | 1.30                     | 45                             | 6600                    | 1.15                     |
| 85                   | "     | "    | 59                             | 6400                    | 1.41                     | 50                             | 6500                    | 1.20                     | 44                             | 6700                    | 1.06                     |
| 90                   | "     | "    | 58                             | 6500                    | 1.31                     | 49                             | 6600                    | 1.10                     | 43                             | 6700                    | .98                      |
| 95                   | "     | "    | 57                             | 6500                    | 1.22                     | 48                             | 6600                    | 1.03                     | 42                             | 6800                    | .90                      |
| 100                  | "     | "    | 56                             | 6600                    | 1.14                     | 47                             | 6700                    | .96                      | 41                             | 6800                    | .84                      |

# PRODUCTION TABLE FOR TWISTING

## FIVE PLY PRODUCTION TABLE

POUNDS PER SPINDLE PER WEEK OF 58 HOURS

| Number<br>of<br>Yarn | Gauge | Ring | MULTIPLIER 2                   |                         |                          | MULTIPLIER 3                   |                         |                          | MULTIPLIER 4                   |                         |                          |
|----------------------|-------|------|--------------------------------|-------------------------|--------------------------|--------------------------------|-------------------------|--------------------------|--------------------------------|-------------------------|--------------------------|
|                      |       |      | R.P.M.<br>of<br>1½ in.<br>Roll | R.P.M.<br>of<br>Spindle | Pounds<br>per<br>Spindle | R.P.M.<br>of<br>1½ in.<br>Roll | R.P.M.<br>of<br>Spindle | Pounds<br>per<br>Spindle | R.P.M.<br>of<br>1½ in.<br>Roll | R.P.M.<br>of<br>Spindle | Pounds<br>per<br>Spindle |
| 4                    | 5½"   | 4½"  | 180                            | 1500                    | 91.51                    | 174                            | 2200                    | 90.83                    | 142                            | 2400                    | 77.50                    |
| 5                    | "     | "    | 177                            | 1700                    | 75.35                    | 167                            | 2400                    | 72.63                    | 134                            | 2500                    | 60.31                    |
| 6                    | "     | "    | 175                            | 1800                    | 63.67                    | 161                            | 2500                    | 60.03                    | 127                            | 2600                    | 48.49                    |
| 7                    | 5"    | 4"   | 173                            | 1900                    | 54.95                    | 155                            | 2600                    | 50.43                    | 122                            | 2700                    | 40.55                    |
| 8                    | "     | "    | 171                            | 2000                    | 48.04                    | 151                            | 2700                    | 43.40                    | 119                            | 2800                    | 34.93                    |
| 9                    | "     | "    | 170                            | 2100                    | 42.82                    | 148                            | 2800                    | 38.08                    | 116                            | 2900                    | 30.41                    |
| 10                   | "     | "    | 169                            | 2200                    | 38.58                    | 146                            | 2900                    | 33.97                    | 114                            | 3000                    | 26.96                    |
| 11                   | "     | "    | 168                            | 2300                    | 35.07                    | 144                            | 3000                    | 30.56                    | 112                            | 3100                    | 24.19                    |
| 12                   | 4½"   | 3½"  | 167                            | 2400                    | 32.11                    | 142                            | 3100                    | 27.72                    | 111                            | 3200                    | 22.05                    |
| 13                   | "     | "    | 166                            | 2500                    | 29.57                    | 141                            | 3200                    | 25.50                    | 110                            | 3300                    | 20.24                    |
| 14                   | "     | "    | 165                            | 2600                    | 27.35                    | 140                            | 3300                    | 23.57                    | 109                            | 3400                    | 18.66                    |
| 15                   | "     | "    | 164                            | 2700                    | 25.44                    | 139                            | 3400                    | 21.88                    | 109                            | 3500                    | 17.46                    |
| 16                   | "     | "    | 163                            | 2700                    | 23.76                    | 138                            | 3500                    | 20.42                    | 108                            | 3600                    | 16.25                    |
| 17                   | "     | "    | 163                            | 2800                    | 22.38                    | 137                            | 3600                    | 19.12                    | 107                            | 3700                    | 15.19                    |
| 18                   | 4"    | 3"   | 162                            | 2900                    | 21.04                    | 136                            | 3600                    | 17.97                    | 107                            | 3800                    | 14.36                    |
| 19                   | "     | "    | 161                            | 3000                    | 19.83                    | 135                            | 3700                    | 16.91                    | 106                            | 3900                    | 13.49                    |
| 20                   | "     | "    | 161                            | 3000                    | 18.86                    | 134                            | 3800                    | 15.97                    | 105                            | 4000                    | 12.71                    |
| 22                   | "     | "    | 160                            | 3200                    | 17.08                    | 132                            | 3900                    | 14.35                    | 103                            | 4100                    | 11.37                    |
| 24                   | "     | "    | 159                            | 3300                    | 15.59                    | 130                            | 4000                    | 13.00                    | 101                            | 4200                    | 10.25                    |
| 26                   | "     | "    | 158                            | 3400                    | 14.34                    | 128                            | 4100                    | 11.85                    | 100                            | 4300                    | 9.39                     |
| 28                   | 3½"   | 2½"  | 157                            | 3500                    | 13.26                    | 126                            | 4200                    | 10.86                    | 99                             | 4400                    | 8.65                     |
| 30                   | "     | "    | 156                            | 3600                    | 12.32                    | 124                            | 4300                    | 10.00                    | 98                             | 4500                    | 8.01                     |
| 32                   | "     | "    | 155                            | 3700                    | 11.51                    | 123                            | 4400                    | 9.32                     | 97                             | 4600                    | 7.45                     |
| 34                   | "     | "    | 154                            | 3800                    | 10.78                    | 122                            | 4500                    | 8.72                     | 96                             | 4700                    | 6.95                     |
| 36                   | "     | "    | 153                            | 3900                    | 10.14                    | 121                            | 4600                    | 8.18                     | 95                             | 4800                    | 6.51                     |
| 38                   | "     | "    | 152                            | 3900                    | 9.56                     | 120                            | 4700                    | 7.71                     | 94                             | 4900                    | 6.11                     |
| 40                   | "     | "    | 151                            | 4000                    | 9.03                     | 119                            | 4800                    | 7.27                     | 93                             | 5000                    | 5.75                     |
| 42                   | 3¼"   | 2¼"  |                                |                         |                          | 118                            | 4800                    | 6.87                     | 92                             | 5000                    | 5.42                     |
| 44                   | "     | "    |                                |                         |                          | 117                            | 4900                    | 6.51                     | 91                             | 5100                    | 5.13                     |
| 46                   | "     | "    |                                |                         |                          | 116                            | 5000                    | 6.18                     | 90                             | 5100                    | 4.85                     |
| 50                   | "     | "    |                                |                         |                          | 114                            | 5100                    | 5.60                     | 88                             | 5200                    | 4.38                     |
| 55                   | "     | "    |                                |                         |                          | 111                            | 5200                    | 4.97                     | 86                             | 5400                    | 3.90                     |
| 60                   | "     | "    |                                |                         |                          | 108                            | 5300                    | 4.44                     | 84                             | 5500                    | 3.49                     |
| 65                   | 3"    | 2"   |                                |                         |                          |                                |                         |                          | 82                             | 5600                    | 3.15                     |
| 70                   | "     | "    |                                |                         |                          |                                |                         |                          | 81                             | 5700                    | 2.89                     |
| 75                   | "     | "    |                                |                         |                          |                                |                         |                          | 80                             | 5800                    | 2.67                     |
| 80                   | "     | "    |                                |                         |                          |                                |                         |                          | 79                             | 5900                    | 2.47                     |

# PRODUCTION TABLE FOR TWISTING

## FIVE PLY PRODUCTION TABLE

(Continued)

### POUNDS PER SPINDLE PER WEEK OF 58 HOURS

| Number<br>of<br>Yarn | Gauge | Ring | MULTIPLIER 5                   |                         |                          | MULTIPLIER 6                   |                         |                          | MULTIPLIER 7                   |                         |                          |
|----------------------|-------|------|--------------------------------|-------------------------|--------------------------|--------------------------------|-------------------------|--------------------------|--------------------------------|-------------------------|--------------------------|
|                      |       |      | R.P.M.<br>of<br>1½ in.<br>Roll | R.P.M.<br>of<br>Spindle | Pounds<br>per<br>Spindle | R.P.M.<br>of<br>1½ in.<br>Roll | R.P.M.<br>of<br>Spindle | Pounds<br>per<br>Spindle | R.P.M.<br>of<br>1½ in.<br>Roll | R.P.M.<br>of<br>Spindle | Pounds<br>per<br>Spindle |
| 4                    | 5½"   | 4½"  | 119                            | 2500                    | 66.14                    | 103                            | 2600                    | 58.29                    | 88                             | 2600                    | 50.71                    |
| 5                    | "     | "    | 111                            | 2600                    | 51.05                    | 96                             | 2700                    | 44.88                    | 82                             | 2700                    | 38.90                    |
| 6                    | "     | "    | 105                            | 2700                    | 41.04                    | 91                             | 2800                    | 36.07                    | 78                             | 2800                    | 31.30                    |
| 7                    | 5"    | 4"   | 101                            | 2800                    | 34.19                    | 87                             | 2900                    | 29.82                    | 75                             | 2900                    | 26.00                    |
| 8                    | "     | "    | 98                             | 2900                    | 29.23                    | 84                             | 3000                    | 25.37                    | 73                             | 3000                    | 22.29                    |
| 9                    | "     | "    | 96                             | 3000                    | 25.56                    | 82                             | 3100                    | 22.11                    | 71                             | 3100                    | 19.36                    |
| 10                   | "     | "    | 94                             | 3100                    | 22.61                    | 80                             | 3200                    | 19.48                    | 69                             | 3200                    | 16.99                    |
| 11                   | "     | "    | 93                             | 3200                    | 20.40                    | 79                             | 3300                    | 17.55                    | 68                             | 3300                    | 15.25                    |
| 12                   | 4½"   | 3½"  | 92                             | 3300                    | 18.54                    | 78                             | 3400                    | 15.92                    | 67                             | 3400                    | 13.81                    |
| 13                   | "     | "    | 91                             | 3400                    | 16.97                    | 77                             | 3500                    | 14.54                    | 66                             | 3500                    | 12.57                    |
| 14                   | "     | "    | 90                             | 3500                    | 15.62                    | 77                             | 3600                    | 13.51                    | 66                             | 3600                    | 11.68                    |
| 15                   | "     | "    | 89                             | 3600                    | 14.45                    | 76                             | 3700                    | 12.46                    | 65                             | 3700                    | 10.75                    |
| 16                   | "     | "    | 88                             | 3700                    | 13.41                    | 75                             | 3800                    | 11.54                    | 65                             | 3800                    | 10.09                    |
| 17                   | "     | "    | 88                             | 3800                    | 12.63                    | 75                             | 3900                    | 10.88                    | 64                             | 3900                    | 9.36                     |
| 18                   | 4"    | 3"   | 87                             | 3900                    | 11.81                    | 74                             | 4000                    | 10.14                    | 64                             | 4000                    | 8.85                     |
| 19                   | "     | "    | 86                             | 4000                    | 11.07                    | 73                             | 4000                    | 9.49                     | 63                             | 4100                    | 8.26                     |
| 20                   | "     | "    | 86                             | 4100                    | 10.53                    | 73                             | 4100                    | 9.03                     | 63                             | 4200                    | 7.85                     |
| 22                   | "     | "    | 85                             | 4200                    | 9.48                     | 72                             | 4300                    | 8.11                     | 62                             | 4300                    | 7.03                     |
| 24                   | "     | "    | 84                             | 4300                    | 8.61                     | 71                             | 4400                    | 7.35                     | 61                             | 4400                    | 6.35                     |
| 26                   | "     | "    | 83                             | 4400                    | 7.87                     | 70                             | 4500                    | 6.70                     | 60                             | 4500                    | 5.77                     |
| 28                   | 3½"   | 2½"  | 82                             | 4500                    | 7.23                     | 69                             | 4600                    | 6.14                     | 59                             | 4600                    | 5.27                     |
| 30                   | "     | "    | 81                             | 4600                    | 6.68                     | 68                             | 4700                    | 5.65                     | 59                             | 4700                    | 4.92                     |
| 32                   | "     | "    | 80                             | 4700                    | 6.19                     | 67                             | 4800                    | 5.22                     | 58                             | 4800                    | 4.55                     |
| 34                   | "     | "    | 79                             | 4800                    | 5.76                     | 66                             | 4900                    | 4.85                     | 57                             | 4900                    | 4.21                     |
| 36                   | "     | "    | 78                             | 4900                    | 5.39                     | 66                             | 5000                    | 4.59                     | 57                             | 5000                    | 3.98                     |
| 38                   | "     | "    | 77                             | 5000                    | 5.04                     | 65                             | 5100                    | 4.28                     | 56                             | 5100                    | 3.71                     |
| 40                   | "     | "    | 76                             | 5100                    | 4.73                     | 65                             | 5200                    | 4.08                     | 56                             | 5200                    | 3.53                     |
| 42                   | 3¼"   | 2¼"  | 75                             | 5100                    | 4.45                     | 64                             | 5200                    | 3.83                     | 55                             | 5200                    | 3.30                     |
| 44                   | "     | "    | 74                             | 5200                    | 4.20                     | 63                             | 5300                    | 3.60                     | 54                             | 5300                    | 3.10                     |
| 46                   | "     | "    | 74                             | 5300                    | 4.02                     | 63                             | 5400                    | 3.44                     | 54                             | 5400                    | 2.96                     |
| 50                   | "     | "    | 73                             | 5400                    | 3.65                     | 62                             | 5500                    | 3.12                     | 53                             | 5500                    | 2.68                     |
| 55                   | "     | "    | 71                             | 5500                    | 3.24                     | 60                             | 5600                    | 2.75                     | 51                             | 5600                    | 2.35                     |
| 60                   | "     | "    | 69                             | 5600                    | 2.89                     | 58                             | 5700                    | 2.44                     | 50                             | 5700                    | 2.11                     |
| 65                   | 3"    | 2"   | 67                             | 5700                    | 2.59                     | 57                             | 5800                    | 2.21                     | 49                             | 5800                    | 1.91                     |
| 70                   | "     | "    | 66                             | 5800                    | 2.37                     | 56                             | 5900                    | 2.02                     | 48                             | 5900                    | 1.74                     |
| 75                   | "     | "    | 65                             | 5900                    | 2.18                     | 55                             | 6000                    | 1.86                     | 47                             | 6000                    | 1.59                     |
| 80                   | "     | "    | 64                             | 6000                    | 2.02                     | 54                             | 6100                    | 1.71                     | 46                             | 6100                    | 1.46                     |



# SIX PLY PRODUCTION TABLE

POUNDS PER SPINDLE PER WEEK OF 58 HOURS

| Number<br>of<br>Yarn | Gauge | Ring | MULTIPLIER 2                   |                         |                          | MULTIPLIER 3                   |                         |                          | MULTIPLIER 4                   |                         |                          |
|----------------------|-------|------|--------------------------------|-------------------------|--------------------------|--------------------------------|-------------------------|--------------------------|--------------------------------|-------------------------|--------------------------|
|                      |       |      | R.P.M.<br>of<br>1½ in.<br>Roll | R.P.M.<br>of<br>Spindle | Pounds<br>per<br>Spindle | R.P.M.<br>of<br>1½ in.<br>Roll | R.P.M.<br>of<br>Spindle | Pounds<br>per<br>Spindle | R.P.M.<br>of<br>1½ in.<br>Roll | R.P.M.<br>of<br>Spindle | Pounds<br>per<br>Spindle |
| 4                    | 5½"   | 4½"  | 183                            | 1400                    | 110.16                   | 173                            | 2000                    | 106.94                   | 143                            | 2200                    | 92.45                    |
| 5                    | "     | "    | 180                            | 1600                    | 90.78                    | 167                            | 2200                    | 85.31                    | 135                            | 2300                    | 72.22                    |
| 6                    | "     | "    | 178                            | 1700                    | 77.22                    | 163                            | 2300                    | 71.61                    | 128                            | 2400                    | 58.30                    |
| 7                    | "     | "    | 176                            | 1800                    | 66.68                    | 159                            | 2400                    | 61.19                    | 123                            | 2500                    | 48.89                    |
| 8                    | "     | "    | 175                            | 1900                    | 58.66                    | 155                            | 2500                    | 52.95                    | 120                            | 2600                    | 42.12                    |
| 9                    | 5"    | 4"   | 174                            | 2000                    | 52.27                    | 152                            | 2600                    | 46.54                    | 117                            | 2700                    | 36.72                    |
| 10                   | "     | "    | 173                            | 2100                    | 47.06                    | 149                            | 2700                    | 41.30                    | 115                            | 2800                    | 32.63                    |
| 11                   | "     | "    | 172                            | 2200                    | 42.73                    | 147                            | 2800                    | 37.22                    | 114                            | 2900                    | 29.51                    |
| 12                   | "     | "    | 171                            | 2300                    | 39.08                    | 145                            | 2900                    | 33.77                    | 113                            | 3000                    | 26.87                    |
| 13                   | "     | "    | 170                            | 2400                    | 36.00                    | 143                            | 3000                    | 30.86                    | 112                            | 3100                    | 24.64                    |
| 14                   | "     | "    | 169                            | 2400                    | 33.31                    | 142                            | 3100                    | 28.55                    | 111                            | 3200                    | 22.73                    |
| 15                   | 4½"   | 3½"  | 168                            | 2500                    | 30.98                    | 141                            | 3100                    | 26.52                    | 110                            | 3300                    | 21.07                    |
| 16                   | "     | "    | 167                            | 2600                    | 28.93                    | 140                            | 3200                    | 24.74                    | 109                            | 3400                    | 19.60                    |
| 17                   | "     | "    | 166                            | 2600                    | 27.13                    | 139                            | 3300                    | 23.17                    | 108                            | 3400                    | 18.29                    |
| 18                   | "     | "    | 165                            | 2700                    | 25.50                    | 138                            | 3400                    | 21.75                    | 107                            | 3500                    | 17.14                    |
| 19                   | "     | "    | 164                            | 2800                    | 24.04                    | 137                            | 3400                    | 20.48                    | 106                            | 3600                    | 16.10                    |
| 20                   | "     | "    | 163                            | 2800                    | 22.73                    | 136                            | 3500                    | 19.40                    | 106                            | 3700                    | 15.32                    |
| 22                   | 4"    | 3"   | 161                            | 2900                    | 20.48                    | 133                            | 3600                    | 17.25                    | 105                            | 3800                    | 13.84                    |
| 24                   | "     | "    | 160                            | 3000                    | 18.70                    | 131                            | 3700                    | 15.63                    | 104                            | 3900                    | 12.60                    |
| 26                   | "     | "    | 159                            | 3100                    | 17.19                    | 129                            | 3800                    | 14.26                    | 103                            | 4000                    | 11.55                    |
| 28                   | "     | "    | 158                            | 3200                    | 15.90                    | 128                            | 3900                    | 13.16                    | 102                            | 4100                    | 10.64                    |
| 30                   | "     | "    | 157                            | 3300                    | 14.78                    | 127                            | 4000                    | 12.22                    | 101                            | 4200                    | 9.86                     |
| 32                   | "     | "    | 156                            | 3400                    | 13.80                    | 126                            | 4100                    | 11.39                    | 100                            | 4300                    | 9.17                     |
| 34                   | 3½"   | 2½"  |                                |                         |                          | 125                            | 4200                    | 10.66                    | 99                             | 4400                    | 8.56                     |
| 36                   | "     | "    |                                |                         |                          | 124                            | 4300                    | 10.01                    | 98                             | 4500                    | 8.02                     |
| 38                   | "     | "    |                                |                         |                          | 123                            | 4400                    | 9.42                     | 97                             | 4600                    | 7.52                     |
| 40                   | "     | "    |                                |                         |                          | 122                            | 4500                    | 8.88                     | 96                             | 4700                    | 7.08                     |
| 42                   | "     | "    |                                |                         |                          | 121                            | 4500                    | 8.40                     | 95                             | 4700                    | 6.68                     |
| 44                   | "     | "    |                                |                         |                          | 120                            | 4600                    | 7.96                     | 94                             | 4800                    | 6.32                     |
| 46                   | "     | "    |                                |                         |                          | 119                            | 4700                    | 7.56                     | 93                             | 4900                    | 5.99                     |
| 50                   | 3¼"   | 2¼"  |                                |                         |                          |                                |                         |                          | 91                             | 5000                    | 5.40                     |
| 55                   | "     | "    |                                |                         |                          |                                |                         |                          | 89                             | 5100                    | 4.81                     |
| 60                   | "     | "    |                                |                         |                          |                                |                         |                          | 87                             | 5200                    | 4.32                     |
| 65                   | "     | "    |                                |                         |                          |                                |                         |                          | 85                             | 5300                    | 3.91                     |
| 70                   | "     | "    |                                |                         |                          |                                |                         |                          | 84                             | 5400                    | 3.59                     |



# PRODUCTION TABLE FOR TWISTING

## SIX PLY PRODUCTION TABLE

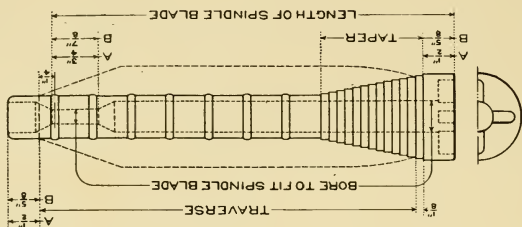
(Continued)

### POUNDS PER SPINDLE PER WEEK OF 58 HOURS

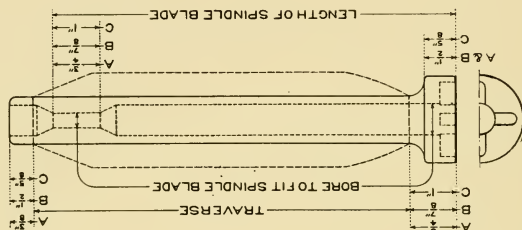
| Number<br>of<br>Yarn | Gauge | Ring | MULTIPLIER 5                   |                         |                          | MULTIPLIER 6                   |                         |                          | MULTIPLIER 7                   |                         |                          |
|----------------------|-------|------|--------------------------------|-------------------------|--------------------------|--------------------------------|-------------------------|--------------------------|--------------------------------|-------------------------|--------------------------|
|                      |       |      | R.P.M.<br>of<br>1½ in.<br>Roll | R.P.M.<br>of<br>Spindle | Pounds<br>per<br>Spindle | R.P.M.<br>of<br>1½ in.<br>Roll | R.P.M.<br>of<br>Spindle | Pounds<br>per<br>Spindle | R.P.M.<br>of<br>1½ in.<br>Roll | R.P.M.<br>of<br>Spindle | Pounds<br>per<br>Spindle |
| 4                    | 5½"   | 4½"  | 120                            | 2300                    | 79.56                    | 100                            | 2300                    | 67.52                    | 86                             | 2300                    | 59.10                    |
| 5                    | "     | "    | 113                            | 2400                    | 62.06                    | 94                             | 2400                    | 52.49                    | 80                             | 2400                    | 45.29                    |
| 6                    | "     | "    | 107                            | 2500                    | 49.96                    | 89                             | 2500                    | 42.19                    | 76                             | 2500                    | 36.47                    |
| 7                    | "     | "    | 103                            | 2600                    | 41.61                    | 85                             | 2600                    | 34.81                    | 73                             | 2600                    | 30.27                    |
| 8                    | "     | "    | 100                            | 2700                    | 35.55                    | 83                             | 2700                    | 29.94                    | 71                             | 2700                    | 25.90                    |
| 9                    | 5"    | 4"   | 98                             | 2800                    | 31.18                    | 81                             | 2800                    | 26.09                    | 70                             | 2800                    | 22.80                    |
| 10                   | "     | "    | 96                             | 2900                    | 27.61                    | 80                             | 2900                    | 23.27                    | 69                             | 2900                    | 20.29                    |
| 11                   | "     | "    | 95                             | 3000                    | 24.92                    | 79                             | 3000                    | 20.96                    | 68                             | 3000                    | 18.22                    |
| 12                   | "     | "    | 94                             | 3100                    | 22.66                    | 78                             | 3100                    | 19.02                    | 67                             | 3100                    | 16.50                    |
| 13                   | "     | "    | 93                             | 3200                    | 20.74                    | 77                             | 3200                    | 17.36                    | 66                             | 3200                    | 15.03                    |
| 14                   | "     | "    | 92                             | 3300                    | 19.10                    | 77                             | 3300                    | 16.16                    | 66                             | 3300                    | 13.99                    |
| 15                   | 4½"   | 3½"  | 91                             | 3400                    | 17.67                    | 76                             | 3400                    | 14.92                    | 65                             | 3400                    | 12.87                    |
| 16                   | "     | "    | 90                             | 3500                    | 16.40                    | 75                             | 3500                    | 13.82                    | 65                             | 3500                    | 12.08                    |
| 17                   | "     | "    | 89                             | 3500                    | 15.28                    | 75                             | 3600                    | 13.02                    | 64                             | 3600                    | 11.20                    |
| 18                   | "     | "    | 88                             | 3600                    | 14.29                    | 74                             | 3600                    | 12.15                    | 64                             | 3700                    | 10.60                    |
| 19                   | "     | "    | 87                             | 3700                    | 13.40                    | 73                             | 3700                    | 11.37                    | 63                             | 3700                    | 9.89                     |
| 20                   | "     | "    | 87                             | 3800                    | 12.74                    | 73                             | 3800                    | 10.81                    | 63                             | 3800                    | 9.40                     |
| 22                   | 4"    | 3"   | 86                             | 3900                    | 11.47                    | 72                             | 3900                    | 9.71                     | 62                             | 3900                    | 8.41                     |
| 24                   | "     | "    | 85                             | 4000                    | 10.42                    | 71                             | 4000                    | 8.80                     | 61                             | 4000                    | 7.60                     |
| 26                   | "     | "    | 84                             | 4100                    | 9.52                     | 70                             | 4100                    | 8.01                     | 60                             | 4100                    | 6.90                     |
| 28                   | "     | "    | 83                             | 4200                    | 8.76                     | 69                             | 4200                    | 7.34                     | 59                             | 4200                    | 6.32                     |
| 30                   | "     | "    | 82                             | 4300                    | 8.09                     | 68                             | 4300                    | 6.76                     | 58                             | 4300                    | 5.80                     |
| 32                   | "     | "    | 81                             | 4400                    | 7.50                     | 68                             | 4400                    | 6.35                     | 58                             | 4400                    | 5.44                     |
| 34                   | 3½"   | 2½"  | 80                             | 4500                    | 6.98                     | 67                             | 4500                    | 5.88                     | 57                             | 4500                    | 5.04                     |
| 36                   | "     | "    | 79                             | 4600                    | 6.52                     | 66                             | 4600                    | 5.49                     | 57                             | 4600                    | 4.77                     |
| 38                   | "     | "    | 79                             | 4700                    | 6.18                     | 66                             | 4700                    | 5.21                     | 56                             | 4700                    | 4.44                     |
| 40                   | "     | "    | 78                             | 4700                    | 5.81                     | 65                             | 4700                    | 4.88                     | 56                             | 4800                    | 4.22                     |
| 42                   | "     | "    | 77                             | 4800                    | 5.46                     | 65                             | 4800                    | 4.65                     | 55                             | 4800                    | 3.95                     |
| 44                   | "     | "    | 77                             | 4900                    | 5.22                     | 64                             | 4900                    | 4.37                     | 55                             | 4900                    | 3.78                     |
| 46                   | "     | "    | 76                             | 5000                    | 4.93                     | 64                             | 5000                    | 4.19                     | 55                             | 5000                    | 3.61                     |
| 50                   | 3¼"   | 2¼"  | 75                             | 5100                    | 4.49                     | 63                             | 5100                    | 3.80                     | 54                             | 5100                    | 3.27                     |
| 55                   | "     | "    | 73                             | 5200                    | 3.98                     | 61                             | 5200                    | 3.35                     | 52                             | 5200                    | 2.86                     |
| 60                   | "     | "    | 71                             | 5300                    | 3.55                     | 59                             | 5300                    | 2.97                     | 51                             | 5300                    | 2.58                     |
| 65                   | "     | "    | 69                             | 5400                    | 3.19                     | 58                             | 5400                    | 2.70                     | 50                             | 5400                    | 2.33                     |
| 70                   | "     | "    | 68                             | 5500                    | 2.92                     | 57                             | 5500                    | 2.46                     | 49                             | 5500                    | 2.13                     |

## STYLES AND DIMENSIONS OF BOBBINS

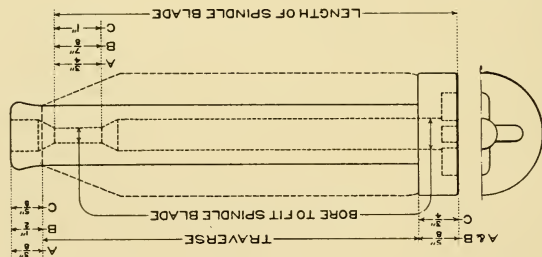
FILLING



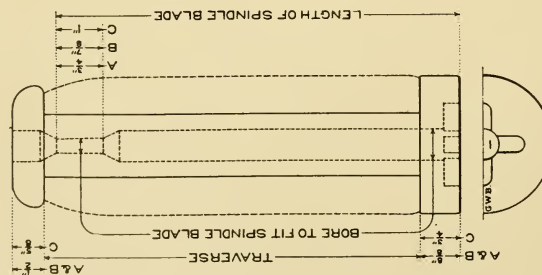
WARP



TAPER TOP



STRAIGHT



# STYLES AND DIMENSIONS OF BOBBINS—(Continued)

| SIZE OF RING | L'gh of Trav. * | STRAIGHT WIND        |                   |                         |                         | TAPER TOP WIND          |                         |                         |                         | WARP WIND               |                         |                         |                         | FILLING WIND            |                         |                         |      |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |   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|              |                 | Diam. of Bottom Head | Diam. of Top Head | Diam. of Yarn on Bobbin | Diam. of Yarn on Bobbin | Diam. of Yarn on Bobbin | Diam. of Yarn on Bobbin | Diam. of Yarn on Bobbin | Diam. of Yarn on Bobbin | Diam. of Yarn on Bobbin | Diam. of Yarn on Bobbin | Diam. of Yarn on Bobbin | Diam. of Yarn on Bobbin | Diam. of Yarn on Bobbin | Diam. of Yarn on Bobbin | Diam. of Yarn on Bobbin |      |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |   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       |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |   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   |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| 1 1/2"       | 5"              | 1 1/4"               | 1"                | 1 1/8"                  | .084                    | 1 1/8"                  | .093                    | 1 1/4"                  | 1 1/8"                  | .079                    | 1 1/8"                  | .088                    | 1 1/4"                  | 1 1/8"                  | .073                    | 1 1/8"                  | .081 | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" | 1 1/8" | 1 1/4" |

\* The letters A, B and C refer to the cut on the opposite page and show the dimensions which apply to each size of ring.

NOTES: In addition to the styles of bobbins given above may be mentioned the Spool and the Reverse Taper Top Wind bobbins. The Spool Wind bobbin has a top head of the same diameter as the bottom head, but is otherwise the same as the Straight Wind bobbin; the Reverse Taper Top Wind bobbin is similar to the Taper Top Wind bobbin except that it has a straight top like the Warp Wind bobbin, with an allowance of an additional quarter of an inch above the top of the wind.

The weight of yarn on bobbins as given above is an average only, since for any particular case this weight varies according to the number of yarn, ply, twist per inch, speed of spindles, weight of travelers, etc. The weight of yarn for wet twist on filling wind has been omitted from the tables, as this wind is not considered satisfactory for wet twisting.

## CYLINDER SPEED TABLE

REVOLUTIONS PER MINUTE OF 7 INCH CYLINDER  
REQUIRED FOR VARIOUS SPINDLE SPEEDS

| Revolutions<br>per<br>Minute<br>of<br>Spindle | REVOLUTIONS PER MINUTE OF CYLINDER |                          |                          |                          |                          |
|---|------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
|   | 1 IN. WHIRL                        | $1\frac{1}{8}$ IN. WHIRL | $1\frac{1}{4}$ IN. WHIRL | $1\frac{3}{8}$ IN. WHIRL | $1\frac{1}{2}$ IN. WHIRL |
|   | Ratio 6.18                         | Ratio 5.61               | Ratio 5.12               | Ratio 4.70               | Ratio 4.35               |
| 3000  |                                    |                          |                          | 638                      | 690                      |
| 3100  |                                    |                          |                          | 660                      | 713                      |
| 3200  |                                    |                          |                          | 681                      | 736                      |
| 3300  |                                    |                          |                          | 702                      | 759                      |
| 3400  |                                    |                          |                          | 723                      | 782                      |
| 3500  |                                    |                          | 684                      | 745                      | 805                      |
| 3600  |                                    |                          | 703                      | 766                      | 828                      |
| 3700  |                                    |                          | 723                      | 787                      | 851                      |
| 3800  |                                    |                          | 742                      | 809                      | 874                      |
| 3900  |                                    |                          | 762                      | 830                      | 897                      |
| 4000  |                                    | 713                      | 781                      | 851                      | 920                      |
| 4100  |                                    | 731                      | 801                      | 872                      | 943                      |
| 4200  |                                    | 749                      | 820                      | 894                      | 966                      |
| 4300  |                                    | 766                      | 840                      | 915                      | 988                      |
| 4400  |                                    | 784                      | 859                      | 936                      | 1011                     |
| 4500  | 728                                | 802                      | 879                      | 957                      | 1034                     |
| 4600  | 744                                | 820                      | 898                      | 979                      | 1057                     |
| 4700  | 761                                | 838                      | 918                      | 1000                     | 1080                     |
| 4800  | 777                                | 856                      | 938                      | 1021                     | 1103                     |
| 4900  | 793                                | 873                      | 957                      | 1043                     | 1126                     |
| 5000  | 809                                | 891                      | 977                      | 1064                     | 1149                     |
| 5100  | 825                                | 909                      | 996                      | 1085                     | 1172                     |
| 5200  | 841                                | 927                      | 1016                     | 1106                     | 1195                     |
| 5300  | 858                                | 945                      | 1035                     | 1128                     | 1218                     |
| 5400  | 874                                | 963                      | 1055                     | 1149                     | 1241                     |
| 5500  | 890                                | 980                      | 1074                     | 1170                     | 1264                     |
| 5600  | 906                                | 998                      | 1094                     | 1191                     | 1287                     |
| 5700  | 922                                | 1016                     | 1113                     | 1213                     | 1310                     |
| 5800  | 939                                | 1034                     | 1133                     | 1234                     | 1333                     |
| 5900  | 955                                | 1052                     | 1152                     | 1255                     | 1356                     |
| 6000  | 971                                | 1070                     | 1172                     | 1277                     | 1379                     |
| 6100  | 987                                | 1087                     | 1191                     | 1298                     | 1402                     |
| 6200  | 1003                               | 1105                     | 1211                     | 1319                     | 1425                     |
| 6300  | 1019                               | 1123                     | 1230                     | 1340                     | 1448                     |
| 6400  | 1036                               | 1141                     | 1250                     | 1362                     | 1471                     |
| 6500  | 1052                               | 1159                     | 1270                     | 1383                     | 1494                     |
| 6600  | 1068                               | 1176                     | 1289                     | 1404                     | 1517                     |
| 6700  | 1084                               | 1194                     | 1309                     | 1426                     | 1540                     |
| 6800  | 1100                               | 1212                     | 1328                     | 1447                     | 1563                     |
| 6900  | 1117                               | 1230                     | 1348                     | 1468                     | 1586                     |
| 7000  | 1133                               | 1248                     | 1367                     | 1489                     |                          |
| 7100  | 1149                               | 1266                     | 1387                     | 1511                     |                          |
| 7200  | 1165                               | 1283                     | 1406                     | 1532                     |                          |
| 7300  | 1181                               | 1301                     | 1426                     | 1553                     |                          |
| 7400  | 1197                               | 1319                     | 1445                     | 1574                     |                          |
| 7500  | 1214                               | 1337                     | 1465                     |                          |                          |
| 7600  | 1230                               | 1355                     | 1484                     |                          |                          |
| 7700  | 1246                               | 1373                     | 1504                     |                          |                          |
| 7800  | 1262                               | 1390                     | 1523                     |                          |                          |
| 7900  | 1278                               | 1408                     | 1543                     |                          |                          |
| 8000  | 1294                               | 1426                     | 1563                     |                          |                          |

**CYLINDER SPEED TABLE**—(Continued)

**REVOLUTIONS PER MINUTE OF 7 INCH CYLINDER  
REQUIRED FOR VARIOUS SPINDLE SPEEDS**

| Revolutions<br>per<br>Minute<br>of<br>Spindle | REVOLUTIONS PER MINUTE OF CYLINDER      |   |                           |   |   |
|---|---|---|---------------------------|---|---|
|   | 1 $\frac{5}{8}$ IN. WHIRL<br>Ratio 4.04 | 1 $\frac{3}{4}$ IN. WHIRL<br>Ratio 3.77 | 2 IN. WHIRL<br>Ratio 3.35 | 2 $\frac{1}{4}$ IN. WHIRL<br>Ratio 2.96 | 2 $\frac{1}{2}$ IN. WHIRL<br>Ratio 2.64 |
| 1500  |   |   | 448                       | 507                                     | 568                                     |
| 1600  |   |   | 478                       | 541                                     | 606                                     |
| 1700  |   |   | 507                       | 574                                     | 644                                     |
| 1800  |   |   | 537                       | 608                                     | 682                                     |
| 1900  |   |   | 567                       | 642                                     | 720                                     |
| 2000  |   | 531                                     | 597                       | 676                                     | 758                                     |
| 2100  |   | 557                                     | 627                       | 709                                     | 795                                     |
| 2200  |   | 584                                     | 657                       | 743                                     | 833                                     |
| 2300  |   | 610                                     | 687                       | 777                                     | 871                                     |
| 2400  |   | 637                                     | 716                       | 811                                     | 909                                     |
| 2500  | 619                                     | 663                                     | 746                       | 845                                     | 947                                     |
| 2600  | 644                                     | 690                                     | 776                       | 878                                     | 985                                     |
| 2700  | 668                                     | 716                                     | 806                       | 912                                     | 1023                                    |
| 2800  | 693                                     | 743                                     | 836                       | 946                                     | 1061                                    |
| 2900  | 718                                     | 769                                     | 866                       | 980                                     | 1098                                    |
| 3000  | 743                                     | 796                                     | 896                       | 1014                                    | 1136                                    |
| 3100  | 767                                     | 822                                     | 925                       | 1047                                    | 1174                                    |
| 3200  | 792                                     | 849                                     | 955                       | 1081                                    | 1212                                    |
| 3300  | 817                                     | 875                                     | 985                       | 1115                                    | 1250                                    |
| 3400  | 842                                     | 902                                     | 1015                      | 1149                                    | 1288                                    |
| 3500  | 866                                     | 928                                     | 1045                      | 1182                                    | 1326                                    |
| 3600  | 891                                     | 955                                     | 1075                      | 1216                                    | 1364                                    |
| 3700  | 916                                     | 981                                     | 1104                      | 1250                                    | 1402                                    |
| 3800  | 941                                     | 1008                                    | 1134                      | 1284                                    | 1439                                    |
| 3900  | 965                                     | 1034                                    | 1164                      | 1318                                    | 1477                                    |
| 4000  | 990                                     | 1061                                    | 1194                      | 1351                                    | 1515                                    |
| 4100  | 1015                                    | 1088                                    | 1224                      | 1385                                    | 1553                                    |
| 4200  | 1040                                    | 1114                                    | 1254                      | 1419                                    | 1591                                    |
| 4300  | 1064                                    | 1141                                    | 1284                      | 1453                                    | 1629                                    |
| 4400  | 1089                                    | 1167                                    | 1313                      | 1486                                    | 1667                                    |
| 4500  | 1114                                    | 1194                                    | 1343                      | 1520                                    |   |
| 4600  | 1139                                    | 1220                                    | 1373                      | 1554                                    |   |
| 4700  | 1163                                    | 1247                                    | 1403                      | 1588                                    |   |
| 4800  | 1188                                    | 1273                                    | 1433                      | 1622                                    |   |
| 4900  | 1213                                    | 1300                                    | 1463                      | 1655                                    |   |
| 5000  | 1238                                    | 1326                                    | 1493                      |   |   |
| 5100  | 1262                                    | 1353                                    | 1522                      |   |   |
| 5200  | 1287                                    | 1379                                    | 1552                      |   |   |
| 5300  | 1312                                    | 1406                                    | 1582                      |   |   |
| 5400  | 1337                                    | 1432                                    | 1612                      |   |   |
| 5500  | 1361                                    | 1459                                    |                           |   |   |
| 5600  | 1386                                    | 1485                                    |                           |   |   |
| 5700  | 1411                                    | 1512                                    |                           |   |   |
| 5800  | 1436                                    | 1538                                    |                           |   |   |
| 5900  | 1460                                    | 1565                                    |                           |   |   |
| 6000  | 1485                                    |   |                           |   |   |
| 6100  | 1510                                    |   |                           |   |   |
| 6200  | 1535                                    |   |                           |   |   |
| 6300  | 1559                                    |   |                           |   |   |
| 6400  | 1584                                    |   |                           |   |   |
| 6500  | 1609                                    |   |                           |   |   |

## CYLINDER SPEED TABLE

REVOLUTIONS PER MINUTE OF 8 INCH CYLINDER  
REQUIRED FOR VARIOUS SPINDLE SPEEDS

| Revolutions<br>per<br>Minute<br>of<br>Spindle | REVOLUTIONS PER MINUTE OF CYLINDER |                          |                          |                          |                          |
|---|------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
|   | 1 IN. WHIRL                        | $1\frac{1}{8}$ IN. WHIRL | $1\frac{1}{4}$ IN. WHIRL | $1\frac{3}{8}$ IN. WHIRL | $1\frac{1}{2}$ IN. WHIRL |
|   | Ratio 7.04                         | Ratio 6.39               | Ratio 5.83               | Ratio 5.35               | Ratio 4.95               |
| 3000  |                                    |                          |                          | 561                      | 606                      |
| 3100  |                                    |                          |                          | 579                      | 626                      |
| 3200  |                                    |                          |                          | 598                      | 646                      |
| 3300  |                                    |                          |                          | 617                      | 667                      |
| 3400  |                                    |                          |                          | 636                      | 687                      |
| 3500  |                                    |                          | 600                      | 654                      | 707                      |
| 3600  |                                    |                          | 617                      | 673                      | 727                      |
| 3700  |                                    |                          | 635                      | 692                      | 747                      |
| 3800  |                                    |                          | 652                      | 710                      | 768                      |
| 3900  |                                    |                          | 669                      | 729                      | 788                      |
| 4000  |                                    | 626                      | 686                      | 748                      | 808                      |
| 4100  |                                    | 642                      | 703                      | 766                      | 828                      |
| 4200  |                                    | 657                      | 720                      | 785                      | 848                      |
| 4300  |                                    | 673                      | 738                      | 804                      | 869                      |
| 4400  |                                    | 689                      | 755                      | 822                      | 889                      |
| 4500  | 639                                | 704                      | 772                      | 841                      | 909                      |
| 4600  | 653                                | 720                      | 789                      | 860                      | 929                      |
| 4700  | 668                                | 736                      | 806                      | 879                      | 949                      |
| 4800  | 682                                | 751                      | 823                      | 897                      | 970                      |
| 4900  | 696                                | 767                      | 840                      | 916                      | 990                      |
| 5000  | 710                                | 782                      | 858                      | 935                      | 1010                     |
| 5100  | 724                                | 798                      | 875                      | 953                      | 1030                     |
| 5200  | 739                                | 813                      | 892                      | 972                      | 1051                     |
| 5300  | 753                                | 829                      | 909                      | 991                      | 1071                     |
| 5400  | 767                                | 845                      | 926                      | 1009                     | 1091                     |
| 5500  | 781                                | 860                      | 943                      | 1028                     | 1111                     |
| 5600  | 795                                | 876                      | 961                      | 1047                     | 1131                     |
| 5700  | 810                                | 892                      | 978                      | 1065                     | 1152                     |
| 5800  | 824                                | 907                      | 995                      | 1084                     | 1172                     |
| 5900  | 838                                | 923                      | 1012                     | 1103                     | 1192                     |
| 6000  | 852                                | 938                      | 1029                     | 1121                     | 1212                     |
| 6100  | 866                                | 954                      | 1046                     | 1140                     | 1232                     |
| 6200  | 881                                | 970                      | 1063                     | 1159                     | 1253                     |
| 6300  | 895                                | 986                      | 1081                     | 1178                     | 1273                     |
| 6400  | 909                                | 1002                     | 1098                     | 1196                     | 1293                     |
| 6500  | 923                                | 1017                     | 1115                     | 1215                     | 1313                     |
| 6600  | 937                                | 1033                     | 1132                     | 1234                     | 1333                     |
| 6700  | 952                                | 1049                     | 1149                     | 1252                     | 1354                     |
| 6800  | 966                                | 1064                     | 1166                     | 1271                     | 1374                     |
| 6900  | 980                                | 1080                     | 1184                     | 1290                     | 1394                     |
| 7000  | 994                                | 1095                     | 1201                     | 1308                     |                          |
| 7100  | 1008                               | 1111                     | 1218                     | 1327                     |                          |
| 7200  | 1023                               | 1127                     | 1235                     | 1346                     |                          |
| 7300  | 1037                               | 1142                     | 1252                     | 1364                     |                          |
| 7400  | 1051                               | 1158                     | 1269                     | 1383                     |                          |
| 7500  | 1065                               | 1174                     | 1286                     |                          |                          |
| 7600  | 1080                               | 1189                     | 1304                     |                          |                          |
| 7700  | 1094                               | 1205                     | 1321                     |                          |                          |
| 7800  | 1108                               | 1221                     | 1338                     |                          |                          |
| 7900  | 1122                               | 1236                     | 1355                     |                          |                          |
| 8000  | 1136                               | 1252                     | 1372                     |                          |                          |



**CYLINDER SPEED TABLE**—(Continued)**REVOLUTIONS PER MINUTE OF 8 INCH CYLINDER  
REQUIRED FOR VARIOUS SPINDLE SPEEDS**

| Revolutions<br>per<br>Minute<br>of<br>Spindle | REVOLUTIONS PER MINUTE OF CYLINDER |                           |             |                           |                           |
|---|------------------------------------|---------------------------|-------------|---------------------------|---------------------------|
|   | 1 $\frac{5}{8}$ IN. WHIRL          | 1 $\frac{3}{4}$ IN. WHIRL | 2 IN. WHIRL | 2 $\frac{1}{4}$ IN. WHIRL | 2 $\frac{1}{2}$ IN. WHIRL |
|   | Ratio 4.60                         | Ratio 4.29                | Ratio 3.81  | Ratio 3.39                | Ratio 3.02                |
| 1500  |                                    |                           | 394         | 442                       | 497                       |
| 1600  |                                    |                           | 420         | 472                       | 530                       |
| 1700  |                                    |                           | 446         | 501                       | 563                       |
| 1800  |                                    |                           | 472         | 531                       | 596                       |
| 1900  |                                    |                           | 499         | 560                       | 629                       |
| 2000  |                                    | 466                       | 525         | 590                       | 662                       |
| 2100  |                                    | 490                       | 551         | 619                       | 695                       |
| 2200  |                                    | 513                       | 577         | 649                       | 728                       |
| 2300  |                                    | 536                       | 604         | 678                       | 762                       |
| 2400  |                                    | 559                       | 630         | 708                       | 795                       |
| 2500  | 543                                | 583                       | 656         | 737                       | 828                       |
| 2600  | 565                                | 606                       | 682         | 767                       | 861                       |
| 2700  | 587                                | 629                       | 709         | 796                       | 894                       |
| 2800  | 609                                | 653                       | 735         | 826                       | 927                       |
| 2900  | 630                                | 676                       | 761         | 855                       | 960                       |
| 3000  | 652                                | 699                       | 787         | 885                       | 993                       |
| 3100  | 674                                | 723                       | 814         | 914                       | 1026                      |
| 3200  | 696                                | 746                       | 840         | 944                       | 1060                      |
| 3300  | 717                                | 769                       | 866         | 973                       | 1093                      |
| 3400  | 739                                | 793                       | 892         | 1003                      | 1126                      |
| 3500  | 761                                | 816                       | 918         | 1032                      | 1159                      |
| 3600  | 783                                | 839                       | 945         | 1062                      | 1192                      |
| 3700  | 804                                | 862                       | 971         | 1091                      | 1225                      |
| 3800  | 826                                | 886                       | 997         | 1121                      | 1258                      |
| 3900  | 848                                | 909                       | 1024        | 1150                      | 1291                      |
| 4000  | 870                                | 932                       | 1050        | 1180                      | 1325                      |
| 4100  | 891                                | 956                       | 1076        | 1209                      | 1358                      |
| 4200  | 913                                | 979                       | 1102        | 1239                      | 1391                      |
| 4300  | 935                                | 1002                      | 1128        | 1268                      | 1424                      |
| 4400  | 957                                | 1026                      | 1155        | 1298                      | 1457                      |
| 4500  | 978                                | 1049                      | 1181        | 1327                      |                           |
| 4600  | 1000                               | 1072                      | 1207        | 1357                      |                           |
| 4700  | 1022                               | 1096                      | 1234        | 1386                      |                           |
| 4800  | 1043                               | 1119                      | 1260        | 1416                      |                           |
| 4900  | 1065                               | 1142                      | 1286        | 1446                      |                           |
| 5000  | 1087                               | 1166                      | 1312        |                           |                           |
| 5100  | 1109                               | 1189                      | 1339        |                           |                           |
| 5200  | 1130                               | 1212                      | 1365        |                           |                           |
| 5300  | 1152                               | 1235                      | 1391        |                           |                           |
| 5400  | 1174                               | 1259                      | 1417        |                           |                           |
| 5500  | 1196                               | 1282                      |             |                           |                           |
| 5600  | 1217                               | 1305                      |             |                           |                           |
| 5700  | 1239                               | 1329                      |             |                           |                           |
| 5800  | 1261                               | 1352                      |             |                           |                           |
| 5900  | 1283                               | 1375                      |             |                           |                           |
| 6000  | 1304                               |                           |             |                           |                           |
| 6100  | 1326                               |                           |             |                           |                           |
| 6200  | 1348                               |                           |             |                           |                           |
| 6300  | 1370                               |                           |             |                           |                           |
| 6400  | 1391                               |                           |             |                           |                           |
| 6500  | 1413                               |                           |             |                           |                           |

# GROOVED PULLEY SPEED TABLE

REVOLUTIONS PER MINUTE OF 6 INCH GROOVED PULLEY  
REQUIRED FOR VARIOUS SPINDLE SPEEDS

| Revolutions<br>per<br>Minute<br>of<br>Spindle | REVOLUTIONS PER MINUTE OF GROOVED PULLEY |                  |                  |                 |                  |                  |
|---|--|------------------|------------------|-----------------|------------------|------------------|
|   | 1½ INCH<br>WHIRL                         | 1⅝ INCH<br>WHIRL | 1¾ INCH<br>WHIRL | 2 INCH<br>WHIRL | 2¼ INCH<br>WHIRL | 2½ INCH<br>WHIRL |
|   | Ratio 3.57                               | Ratio 3.32       | Ratio 3.12       | Ratio 2.77      | Ratio 2.49       | Ratio 2.26       |
| 1000  |  |                  | 321              | 361             | 402              | 442              |
| 1100  |  |                  | 353              | 397             | 442              | 487              |
| 1200  |  |                  | 385              | 433             | 482              | 531              |
| 1300  |  |                  | 417              | 463             | 522              | 575              |
| 1400  |  |                  | 449              | 505             | 562              | 619              |
| 1500  |  | 452              | 481              | 542             | 602              | 664              |
| 1600  |  | 482              | 513              | 578             | 643              | 708              |
| 1700  |  | 512              | 545              | 614             | 683              | 752              |
| 1800  |  | 542              | 577              | 650             | 723              | 796              |
| 1900  |  | 572              | 609              | 686             | 763              | 841              |
| 2000  | 560                                      | 602              | 641              | 722             | 803              | 885              |
| 2100  | 588                                      | 633              | 673              | 758             | 843              | 929              |
| 2200  | 616                                      | 663              | 705              | 794             | 884              | 973              |
| 2300  | 644                                      | 693              | 737              | 830             | 924              | 1018             |
| 2400  | 672                                      | 723              | 769              | 866             | 964              | 1062             |
| 2500  | 700                                      | 753              | 801              | 903             | 1004             | 1106             |
| 2600  | 728                                      | 783              | 833              | 939             | 1044             | 1150             |
| 2700  | 756                                      | 813              | 865              | 975             | 1084             | 1195             |
| 2800  | 784                                      | 843              | 897              | 1011            | 1124             | 1239             |
| 2900  | 812                                      | 873              | 929              | 1047            | 1165             | 1283             |
| 3000  | 840                                      | 903              | 962              | 1083            | 1205             | 1327             |
| 3100  | 868                                      | 934              | 994              | 1119            | 1245             | 1371             |
| 3200  | 896                                      | 964              | 1026             | 1155            | 1285             | 1416             |
| 3300  | 924                                      | 994              | 1058             | 1191            | 1325             | 1460             |
| 3400  | 952                                      | 1024             | 1090             | 1227            | 1365             | 1504             |
| 3500  | 980                                      | 1054             | 1122             | 1264            | 1406             |                  |
| 3600  | 1008                                     | 1084             | 1154             | 1300            | 1446             |                  |
| 3700  | 1036                                     | 1115             | 1186             | 1336            | 1486             |                  |
| 3800  | 1064                                     | 1145             | 1218             | 1372            | 1526             |                  |
| 3900  | 1092                                     | 1175             | 1250             | 1408            | 1566             |                  |
| 4000  | 1120                                     | 1205             | 1282             | 1444            |                  |                  |
| 4100  | 1148                                     | 1235             | 1314             | 1480            |                  |                  |
| 4200  | 1176                                     | 1265             | 1346             | 1516            |                  |                  |
| 4300  | 1204                                     | 1295             | 1378             | 1552            |                  |                  |
| 4400  | 1232                                     | 1325             | 1410             | 1588            |                  |                  |
| 4500  | 1261                                     | 1356             | 1442             |                 |                  |                  |
| 4600  | 1289                                     | 1386             | 1474             |                 |                  |                  |
| 4700  | 1317                                     | 1416             | 1506             |                 |                  |                  |
| 4800  | 1345                                     | 1446             | 1538             |                 |                  |                  |
| 4900  | 1373                                     | 1476             | 1570             |                 |                  |                  |
| 5000  | 1401                                     | 1506             |                  |                 |                  |                  |
| 5100  | 1429                                     | 1536             |                  |                 |                  |                  |
| 5200  | 1457                                     | 1566             |                  |                 |                  |                  |
| 5300  | 1485                                     | 1596             |                  |                 |                  |                  |
| 5400  | 1513                                     | 1626             |                  |                 |                  |                  |
| 5500  | 1541                                     |                  |                  |                 |                  |                  |
| 5600  | 1569                                     |                  |                  |                 |                  |                  |
| 5700  | 1597                                     |                  |                  |                 |                  |                  |
| 5800  | 1625                                     |                  |                  |                 |                  |                  |
| 5900  | 1653                                     |                  |                  |                 |                  |                  |
| 6000  | 1681                                     |                  |                  |                 |                  |                  |

## TABLE OF RATIOS

### NUMBER OF TURNS OF SPINDLE TO ONE TURN OF CYLINDER OR GROOVED PULLEY

| Diameter<br>of<br>Spindle<br>Whirl | TURNS OF SPINDLE TO ONE OF CYLINDER<br>OR GROOVED PULLEY |                                  |                                  |
|------------------------------------|--|----------------------------------|----------------------------------|
|                                    | Grooved Pulley<br>6 Inches<br>Diameter                   | Cylinder<br>7 Inches<br>Diameter | Cylinder<br>8 Inches<br>Diameter |
| 1"                                 |  | 6.18                             | 7.04                             |
| 1 $\frac{1}{4}$ "                  |  | 5.61                             | 6.39                             |
| 1 $\frac{1}{2}$ "                  |  | 5.12                             | 5.83                             |
| 1 $\frac{3}{4}$ "                  |  | 4.70                             | 5.35                             |
| 1 $\frac{7}{8}$ "                  | 3.57   | 4.35                             | 4.95                             |
| 1 $\frac{5}{8}$ "                  | 3.32   | 4.04                             | 4.60                             |
| 1 $\frac{3}{8}$ "                  | 3.12   | 3.77                             | 4.29                             |
| 2"                                 | 2.77   | 3.35                             | 3.81                             |
| 2 $\frac{1}{4}$ "                  | 2.49   | 2.96                             | 3.39                             |
| 2 $\frac{1}{2}$ "                  | 2.26   | 2.64                             | 3.02                             |

The above ratios have been obtained from actual tests made with bands suited to the various conditions of fine or coarse work and proportional to the size of whirl. The ratios may however vary in any particular case depending on the size of bands actually used and also on the tension of the bands.

In place of the 7 inch and 8 inch Cylinders for coarse work, we can furnish 7 inch and 8 inch Grooved Pulleys. The Grooved Pulleys are made of such a diameter that they give the same ratios as the corresponding Cylinder Drive, so that the twist gearing tables previously given for the Cylinder Drive may be used also for the Grooved Pulley Drive.

# SPECIFICATIONS

---

Number of Dry Twisters?

Number of Wet Twisters?

Number of Spindles per Twister?

Gauge, or distance from centre to centre of spindles?

Size of Rings?

What make of Rings? *See Foot Note.*


What style of Rings? *See Foot Note.*


What style of Ring Holders? *See Foot Note.*

What pattern of Spindle? Diameter of Whirl? *See Foot Note.*

Length of Traverse? Number of teeth in Lay Gear?

Style of Wind?

Single line Top and Bottom Rolls? 

Double line Bottom and Single line Top Rolls? 

Double line Bottom and Double line Top Rolls? 

Diameter of Bottom Rolls?

Bottom Rolls plain or fluted?

Diameter of Top Rolls?

Diameter of Cylinder? or Diameter of Grooved Pulleys?

Diameter of Tight Pulleys? Width of Face?

Diameter of Loose Pulleys?

Belt from above or below? Are Belt Guards wanted?

What style of Guides for Thread Boards?

What kind of Thread Boards?

## SPECIFICATIONS—(Continued)

Number of Yarn to be twisted?

Number of Ply?

How many Skewers per Spindle?

What style of Creel?

Diameter of Creel Skewers?

Length of Creel Skewers above Washer?

Flat or Oval Washer for Creel Skewers?

Extreme length of Creel Bobbins? *See Foot Note.*

Diameter of Creel Bobbins when full?

Range of Twist?

For what Turns Twist shall we furnish three changes of gears?

Number of teeth in Cylinder Gears?

Number of teeth in Variable Cylinder Gears?

Number of teeth in Jack Gears?

Width of Twistors?

Shall we ship set up on skids, or taken down and packed in car?

By what lines shall we ship?

Shall we send men to erect?

Remarks:

---

NOTE:—If present equipment is to be matched, do not fail to send sample SPINDLE and BOBBIN, RING and HOLDER, also sample CREEL BOBBIN.





24<sup>5</sup>/<sub>2</sub> July 7/16  
for AB Mann Bandages  
Style 1174 & 1186 Parker

24<sup>5</sup>/<sub>2</sub> Trust 40 Turns.

Speed from t roll

Production 1.06 lb 54 Turns.







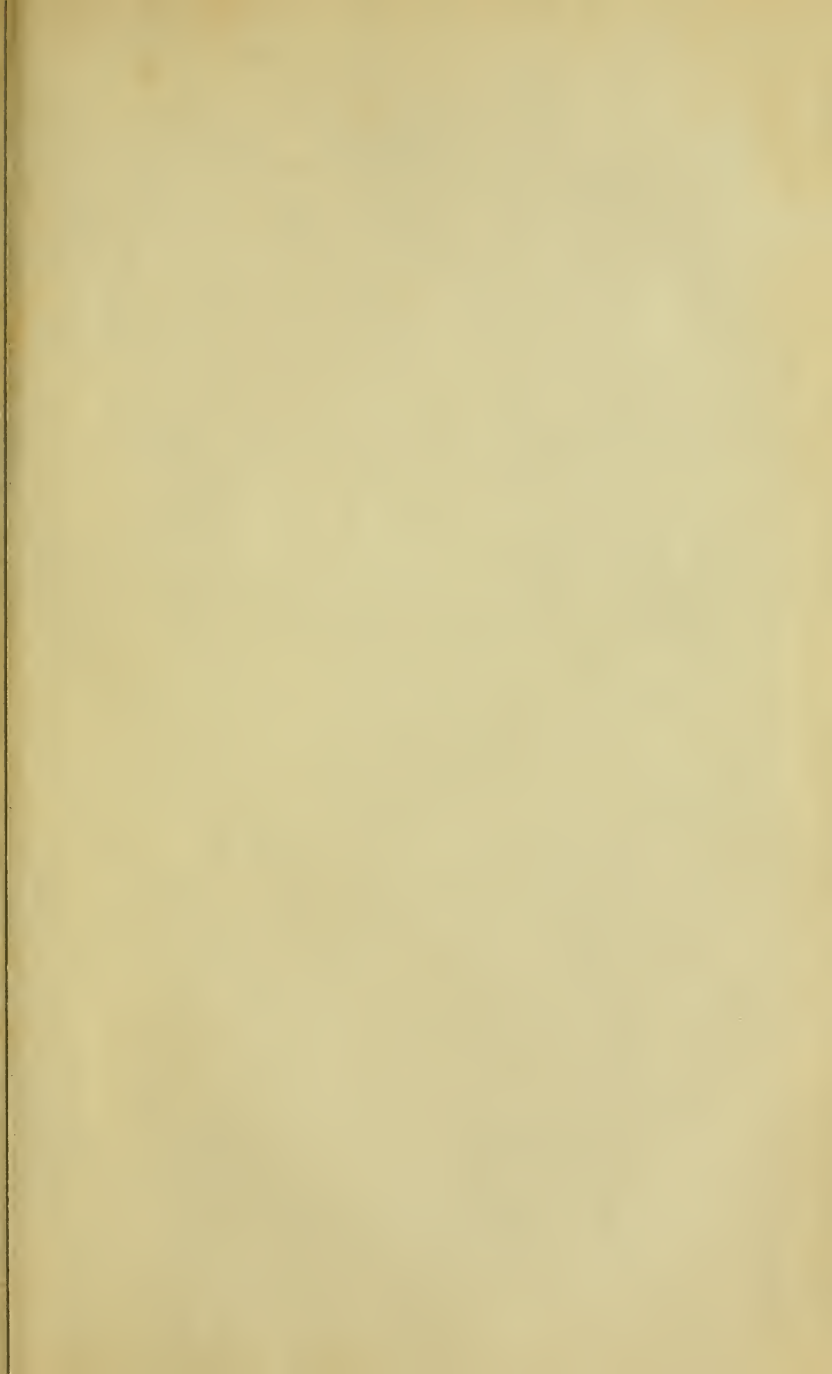




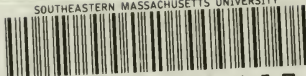








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